



INSTITUTO
UNIVERSITÁRIO
DE LISBOA

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism: Evidence from Public Hospitals in Sanming City of China's Fujian Province

WANG Ling

Doctor of Management

Supervisors:

PhD Luis Martins, Associate Professor,
ISCTE University Institute of Lisbon

PhD Jiang Hong, Professor,
Southern University of Science and Technology

March, 2024



BUSINESS
SCHOOL

Marketing, Operations and General Management Department

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism: Evidence from Public Hospitals in Sanming City of China's Fujian Province

WANG Ling

Doctor of Management

Supervisors:

PhD Luis Martins, Associate Professor,
ISCTE University Institute of Lisbon

PhD Jiang Hong, Professor,
Southern University of Science and Technology

March, 2024



BUSINESS
SCHOOL

Marketing, Operations and General Management Department

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism: Evidence from Public Hospitals in Sanming City of China's Fujian Province

WANG Ling

Doctor of Management

Jury:

PhD Ana Margarida Mendes Camelo Oliveira Brochado, Associate Professor with Habilitation,

Iscte - Instituto Universitário de Lisboa

PhD Ernesto José Ferrão Abreu Pereira, Adjunct Professor,

Escola de Saúde da Cruz Vermelha Portuguesa

PhD Qian Yi, Full Professor,

Southern Medical University (China)

PhD Sofia Maria Lopes Portela, Assistant Professor,

Iscte – Instituto Universitário de Lisboa

PhD Luís Manuel Dias Martins, Associate Investigator,

Iscte- Instituto Universitário de Lisboa

March, 2024

**Relationship Between Pay-for-Performance Satisfaction
and Physician Professionalism: Evidence from Public WANG Ling
Hospitals in Sanming City of China's Fujian Province**

[This page is deliberately left blank.]

Abstract

BACKGROUND: An increasing number of healthcare systems are establishing pay-for-performance system, and there emerges a large amount of research on the relationship between different pay-for performance system and physician professionalism. However, there is still relative scarcity in terms of effective tools to measure physician professionalism, which are developed based on the Chinese cultural background and under the overall integration and interaction. Besides, whether the pay-for-performance system can help uplift physician professionalism remains to be tested.

METHODS: This thesis comprises three studies. Study 1 employs qualitative interviews to explore the relationship between Pay-for-Performance Satisfaction (PFPS) and physician professionalism. Building on the findings of Study 1, Study 2 involves the development of a questionnaire aimed at quantifying physician professionalism. Study 3 utilizes the questionnaire developed in Study 2 to conduct an empirical investigation into the relationship between PFPS and physician professionalism.

RESULTS: 963 surveys were distributed among healthcare professionals in two tertiary hospitals located in Sanming City, Fujian Province, with 824 surveys valid, yielding an 85.57% response rate. After conducting exploratory factor analysis on the initial physician professionalism scale using the research data, 20 entries were grouped into five dimensions according to their semantic connotations. Multiple linear regression analyses of a survey conducted in Sanming City, Fujian Province, with responses from 160 physicians revealed a strong and positive relationship between pay-for-performance satisfaction and physician professionalism. Additionally, the impact of pay-for-performance satisfaction on physician professionalism was found to be influenced by demographic and work status variables.

CONCLUSIONS: The qualitative and quantitative analyses revealed that physicians' professionalism was enhanced by the level of satisfaction with hospital performance pay. The team-based pay for performance distribution system was more effective in fostering teamwork and communication. The pay-for-performance distribution system that is centred around teams fosters collaboration and communication. Additionally, spiritual rewards are better-suited for cultivating a sense of responsibility and motivation amongst physicians in the pursuit of excellence compared to material rewards. The various dimensions of hospital PFPS exhibit

inconsistent impacts. Overall, PFPS is positively correlated with the level of physician professionalism. Generally, PFPS is positively correlated with the overall level of physician professionalism. Specifically, PFPS demonstrates a negative association with the fundamental norms of physician professionalism and the adoption of new technologies and treatments. Conversely, PFPS is positively correlated with welfare benefits and the practical application of physician professionalism. Additionally, satisfaction with salary management is positively associated with the development and perpetuation of physician professionalism, as well as with both medical and social values.

Keywords: Physician professionalism, Hospital management, Pay for Performance, Pay satisfaction, China

JEL: I1, J3

Resumo

FUNDAMENTAÇÃO: Um número crescente de sistemas de saúde está adotando sistemas de pagamento por desempenho, e têm vindo a ser publicados muitos trabalhos científicos sobre a relação entre os diferentes sistemas de pagamento por desempenho e o profissionalismo do médico. No entanto, ainda existe uma relativa escassez em termos de ferramentas eficazes para medir o profissionalismo médico, que são desenvolvidas com base na forma cultural chinesa e no âmbito da integração e interação global. Além disso, ainda não há uma conclusão definitiva se o sistema de pagamento por desempenho pode ajudar a elevar o profissionalismo dos médicos.

MÉTODO: Esta tese é constituída por três estudos. O Estudo 1 utiliza o método qualitativo com entrevistas para explorar a relação entre a Satisfação com o Pagamento por Desempenho (*PFPS Pay-for-Performance Satisfaction*) e o profissionalismo médico. Com base nas conclusões do Estudo 1, o Estudo 2 teve por objeto a construção de um questionário destinado a quantificar o profissionalismo do médico. O Estudo 3 utiliza o questionário desenvolvido no Estudo 2 para conduzir uma investigação empírica sobre a relação entre a *PFPS* e o profissionalismo médico.

RESULTADOS: Foram distribuídos 963 inquéritos entre profissionais de saúde de dois hospitais terciários localizados na cidade de *Sanming*, província de *Fujian*, tendo sido realizados 824 inquéritos válidos, gerando uma taxa de resposta de 85,57%. Após a realização da análise fatorial exploratória da escala inicial de profissionalismo médico, foram agrupadas 20 entradas em cinco dimensões de acordo com as suas conotações semânticas. Análises de regressão linear múltipla de um inquérito realizado na cidade de *Sanming*, província de *Fujian*, com respostas de 160 médicos, revelaram uma relação forte e positiva entre a satisfação com o pagamento por desempenho e o profissionalismo do médico. Além disso, verificou-se que o impacto da satisfação com o pagamento por desempenho no profissionalismo dos médicos é influenciado por variáveis demográficas e da situação profissional.

CONCLUSÕES: As análises qualitativas e quantitativas revelaram que o profissionalismo dos médicos foi potenciado pelo nível de satisfação com a remuneração por desempenho. O sistema de distribuição da remuneração por desempenho baseado na equipa foi mais eficaz na promoção do trabalho em equipa e da comunicação. O sistema de pagamento por desempenho

centrado nas equipas, promove a colaboração e a comunicação. Além disso, as recompensas não materiais são mais adequadas para cultivar um sentido de responsabilidade e motivação entre os médicos na busca da excelência, em comparação com as recompensas materiais. As várias dimensões da *PFPS* hospitalar apresentam impactos inconsistentes. No geral, a *PFPS* está positivamente correlacionada com o nível de profissionalismo do médico. Geralmente, a *PFPS* está positivamente correlacionada com o nível geral de profissionalismo do médico. Especificamente, a *PFPS* demonstra uma associação negativa com as normas fundamentais do profissionalismo médico e a adoção de novas tecnologias e tratamentos. Por outro lado, a *PFPS* está positivamente correlacionada com os benefícios sociais e a aplicação prática do profissionalismo médico. Além disso, a satisfação com este sistema salarial está positivamente associada ao desenvolvimento e perpetuação do profissionalismo médico, bem como aos valores médicos e sociais.

Palavras-chave: Profissionalismo médico, Gestão hospitalar, Pagamento pela performance, Satisfação salarial, China

JEL: I1, J3

摘 要

背景：越来越多的医疗系统都在建立绩效薪酬制度，也涌现出了大量关于不同绩效薪酬制度与医师职业精神相关性的研究。然而，基于中国文化背景且在整体整合交互作用下开发的测量医师职业精神的有效工具较为稀缺，关于绩效薪酬制度是否有助于改善医师职业精神还有待检验。

方法：本论文包含三个研究，研究 1 以定性的访谈探究医院绩效薪酬满意度与医师职业精神两个变量的关系，研究 2 根据研究 1 的结果开发医师职业精神问卷，研究 3 根据研究 2 开发的医师职业精神问卷进行了实证研究以测量医院绩效薪酬满意度与医师职业精神变量关系。

结果：本研究在开发医师职业精神量表过程中共针对福建省三明市 2 所三甲医院的医务工作者共发放问卷 963 份，有效回收 824 份，回收率为 85.57%。运用调研数据对医师职业精神初始量表执行探索因子分析后，余下 20 个条目根据其语义内涵被划分在五个维度。对福建省三明市 160 名医师调查的多元线性回归分析显示，绩效薪酬满意度对医师职业精神水平成显著正相关，绩效薪酬满意度对医师职业精神边际效应受到人口统计学和工作状态变量的调节影响。

结论：定性和定量分析结果显示，医院绩效薪酬满意度水平促进了医师职业精神水平提升，而以团队为基础的绩效薪酬分配制度更有利于构建团队之间的协作与交流、责任感和追求卓越的动力；有利于公平分配医疗资源；有利于级别较低医师的成长和改善医疗质量。医院绩效薪酬满意度各维度影响不一致，医院绩效薪酬满意度与医师职业精神水平呈正比，水平满意度与医师职业精神的基本规范、新技术与新疗法应用存在显著的负向关系，而与福利保障与医师职业精神的医疗实践呈正相关，薪酬管理满意度与医师职业精神的培养与传承以及医疗与社会价值均呈正相关。

关键词：医师职业精神，医院管理，绩效薪酬，薪酬满意度，中国

JEL: I1, J3

[This page is deliberately left blank.]

Acknowledgements

Time flies, and before I know it, the four-year doctoral study is coming to an end. Looking back on the past four years, it was hard, but had the scenery along the way, which made me have mixed feelings. And I have so many people to thank.

First of all, I would like to thank Professor Luis Martins, my Portuguese supervisor. His rigorous academic spirit, well-learned and systematic theoretical system, and strict but tolerant teaching attitude have transformed me from an enterprise manager into a professional researcher. During the process of thesis writing, I was inspired and encouraged all the way, from the selection of the topic to the theoretical framework and research methods. Professor Martins was always very responsive to my questions and gave me a lot of constructive advice, especially when my research was in a difficult situation. I remember that in July 2023, I met Professor Martins in Iscte, and he explained to me the research methods and analysis software of the thesis for several hours in his office. I would like to express my heartfelt thanks to Professor Martins. Without his hard work and professional guidance, I could not have completed this dissertation. At the same time, I would like to thank Professor Jiang, my Chinese supervisor, who helped me sort out the research problems and helped me a lot in the topic selection of my dissertation. She always took time out of her busy schedule to guide me, and told me the importance of communicating with my Portuguese supervisor. Her earnest instructions felt like a spring breeze. Thanks to Professor Jiang's selfless help. Therefore, I would like to extend my highest respect and heartfelt thanks to the two supervisors!

Secondly, I would like to thank Dean Wang Dong and Director Ou Weiyan of the International Programs Office. Dean Wang Dong took time out of his busy schedule to give me guidance on my dissertation. He spent hours in his office to tutor me and prevented me from going in the wrong direction. And I would like to thank Director Ou Weiyan, who is the first teacher I knew in the International Programs Office. In 2019, in the café of SMU, she introduced the DMH program to me, which made me firmly determined to choose the program, and later she taught me how to use Maxqda. And I would also like to thank Ms. Jiang and Ms. Wang of the International Programs Office for their patience in the coordination.

Third, I would like to thank Zhan Jifu, Director of the Sanming Healthcare Reform Leadership Office, who agreed to be my off-campus tutor to ensure the smooth collection of

research data. And I would also like to thank Zhou Xianbao, Deputy Director of Sanming Municipal Health Commission, Yu Xiuqin, Director of the Office of Education, Science, Culture, Health and Sports of Sanming Municipal People's Political Consultative Conference, and the research assistants Xiao Guiyou, Lin Rong, and Liu Rongwei, for their help in literature review, data reorganization, and research. What's more, I would also like to thank President Wu Yongyang of Sanming First Hospital, President Tian Rongmao of Sanming Integrated Medicine Hospital, Chief Chen Congshui of the Medical Department, as well as physicians and health management colleagues for their cooperation in the investigation and data provision during the empirical research. And I would like to express my special thanks to President Tian Rongmao, whose down-to-earth spirit and conscientious attitude have impressed me.

Finally, I would like to thank my family, especially my wife and children, for their support and concern for my study and life over the years. They freed me from housework, so that I had more time for my doctoral study and research. When I was discouraged, they always motivated and encouraged me to continue my study. It was their selfless dedication that I could complete my doctoral dissertation.

And I would like to thank all the classmates of the 2020 intake through this unforgettable journey of my life! Finally, I would like to express my sincere gratitude to all the experts who took time out of their busy schedules to review and defend my dissertation to provide their guidance. I will never forget the valuable learning experience and the learning spirit of the Chinese and Portuguese teachers. And I will adhere to the spirit of self-improvement to reach new heights, and at the same time the critical spirit will guide my future work to achieve my life goals.

致 谢

光阴似箭，岁月如梭，不知不觉间四年的博士生涯即将结束。回首这四年的历程，一路艰辛、一路芬芳，百感交集，思绪万千。纸短情长，有诸多需要感谢的人。

首先，我要感谢葡方导师Luis Martins教授，他严谨的治学精神、博学而成系统的理论体系，严格而缺宽容的教学态度，令我从一名企业管理者蜕变成一个专业的研究者，在论文撰写的过程中，从确定选题、理论框架、研究方法等给予我启发与鼓励。Martins教授总是非常及时地回复我的各种问题并给我提供很多富有建设性的意见，特别是在我研究进入迷茫时期。记得2023年7月随着南方医组织的欧洲学术团见到久违的Martins教授，在他的办公室足足给我讲解了数小时的论文的研究方法和使用的分析软件。在此，我由衷的感谢Martins教授，如果没有他的辛勤付出和专业指导我是无法完成此论文的。同时，我还要感谢我中方的导师姜虹教授，是她帮助我梳理研究的问题，在论文的选题方面给了我很大的帮助，她总是在百忙的工作中抽出时间来指导我，同时告诉我与葡方导师沟通的重要性，是她的谆谆教导，如沐春风般的沁人心脾，感谢姜虹老师给予无私的帮助。向两位导师致以最崇高的敬意和由衷的感谢！

其次，我要感谢项目办的王冬院长和欧玮艳主任，王冬院长在百忙中抽出时间给予我论文的指导，在他的办公室他抽出数小时的时间来辅导我，避免了我往错误的方向上继续前行。感谢欧玮艳主任，她是我项目办第一个认识的老师，记得2019年在南方医校园的咖啡馆里，介绍了中葡博士项目情况，让我坚定了选择中葡博士项目的决心，之后她又指导我Maxqda软件的使用方法，也要感谢项目办的江老师和王老师，她们总是那么的耐心进行协调各项事宜，在此一并致谢。

第三，我要感谢三明医改办詹积富主任、是他同意做我的校外导师，才保证了研究数据的顺利收集，我还要感谢三明市卫健委周显葆副主任、三明市政协教科文卫体于修芹主任、研究助理肖贵友、林容、刘荣威等在文献查阅、数据整理、调研方面给予我的帮助。同时也要感谢三明市第一医院吴用样院长、三明市中西医结合医院田荣茂院长、医务科陈聪水科长，以及医生和卫生管理同仁，在实证研究期间配合进行调研与数据提供的工作，特别是田荣茂院长，他求真务实的精神及认真负责的态度感染了我。

最后，我要感谢我的家人，尤其是我的爱人和孩子，多年来对我学业的支持和生活

上的关心，从来不让我做家务，可以让我腾出更多的时间投入到博士的学习和研究中去，在我灰心散气时，一直给我动力，不断加油鼓励我持续完成学业，是她们无私的奉献才能完成博士学位论文。

感谢2020级博士班全体同学陪我一起走过这段人生难忘的历程！最后，衷心感谢在百忙中对论文进行评审和答辩的各位专家对我的论文予以指导。这段宝贵的学习经历，中葡老师的治学精神，必将令我终生难忘，秉承自强不息的精神理念，不断攀登高峰，同时用批判性精神指引未来的工作，实现人生目标。

Contents

Chapter 1: Overview	1
1.1 Research background and significance	3
1.2 Research on the influencing factors of PFPS beyond and in China.....	7
1.2.1 Research on the influencing factors of PFPS beyond China.....	7
1.2.2 Research on the influencing factors of PFPS in China	8
1.3 Research on the physician professionalism beyond and in China	9
1.3.1 Research on physician professionalism beyond China	9
1.3.2 Research on physician professionalism in China.....	10
1.4 Research objectives and contents	13
1.4.1 Expert interview research.....	13
1.4.2 Developing of the physician professionalism scale	13
1.4.3 Quantitative study on the relationship between PFPS and physician professionalism.....	14
Chapter 2: Theoretical Basis of the Research and Its Relevance	15
2.1 Hospital pay-for-performance satisfaction.....	15
2.1.1 Concept and theoretical basis of hospital pay-for-performance satisfaction ..	15
2.1.2 Measurement of pay satisfaction.....	16
2.1.3 The role of pay satisfaction	16
2.2 Relationship between physician professionalism and pay-for-performance.....	18
2.3 Hospital pay-for-performance	20
2.3.1 US pay-for-performance programs and their development.....	21
2.3.2 UK pay-for-performance programs and their development	23
2.3.3 Pay-for-performance programs in other countries and their development.....	25
2.4 Value-based oncology payment mode in the United States	26
2.4.1 Overview of value-based payment mode	26
2.4.2 Value-based oncology payment mode	26
2.4.3 Patient-centered oncology payment mode	28
2.5 The relationship between physician professionalism and Motivation Theory.....	30
2.6 relationship between pay-for-performance schemes and physician professionalism	32

Chapter 3: Qualitative Study on the Relationship between Pay for Performance and Physician Professionalism	35
3.1 Research method	35
3.2 Data collection.....	36
3.2.1 Interviews	36
3.3 Data analysis process	40
3.4 Discussion	47
3.4.1 Relationship between pay-for-performance satisfaction and physician professionalism.....	47
3.4.2 Influencing factors of pay for performance on the physician professionalism	49
3.5 Problems and improvement strategy	51
3.5.1 Current situation of hospital pay-for-performance that affects physician professionalism.....	51
3.5.2 Analysis of development strategies of hospitals' pay-for-performance based on physician professionalism	54
Chapter 4: Development of the Physician Professionalism Scale.....	61
4.1 Construction of the dimensions of “physician professionalism” based on qualitative meta-analysis.....	61
4.1.1 Sample selection for qualitative research.....	61
4.1.2 Qualitative analysis of research data	62
4.1.3 Interpretation of qualitative analysis results.....	63
4.2 Development and implementation of the Physician Professionalism Initial Scale (PPI-Scale).....	68
4.2.1 Generation of the PPI-Scale	68
4.2.2 Selection of objects and methods for measurement	71
4.3 Analysis of the PP-Scale	72
4.3.1 Project analysis.....	72
4.3.2 Exploratory factor analysis (EFA).....	72
4.3.3 Confirmatory factor analysis	74
4.3.4 Reliability and validity analysis	76
4.4 Test of forecasting effectiveness by the PP-Scale	77
4.4.1 Theoretical background and research hypotheses	77
4.4.2 Test methods.....	78
4.4.3 Test results.....	78

Chapter 5: Quantitative Analysis of the Impact of Hospital Performance-based Pay Satisfaction on Physician Professionalism.....	81
5.1 Analysis method	81
5.1.1 Model construction.....	81
5.1.2 Research hypotheses	84
5.1.3 Sampling method and research plan.....	86
5.1.4 Statistical and analytical methods	87
5.2 Research tools	88
5.2.1 Pay for performance satisfaction questionnaire	88
5.2.2 Physician professionalism scale	89
5.2.3 Self-designed items	90
5.3 Research results.....	91
5.3.1 Descriptive statistics.....	91
5.3.2 Reliability and validity analysis of measurement scales	92
5.3.3 Multiple linear regression analysis results	94
5.3.4 Moderation effect testing.....	102
Chapter 6: Discussion and Conclusion.....	105
6.1 Discussion	105
6.1.1 Qualitative research on the impact of hospital pay-for-performance on physician professionalism.....	105
6.1.2 Discussion on the Physician Professionalism Scale developed in this study	109
6.1.3 Quantitative research on the impact of hospital pay-for-performance on physician professionalism	110
6.1.4 Regression analysis of the impact of hospital pay-for-performance on physician professionalism.....	113
6.2 Conclusion.....	114
6.2.1 Conclusion of qualitative meta-analysis research	114
6.2.2 Expert interview research conclusion	115
6.2.3 Physician Professionalism Scale	115
6.2.4 The relationship between PFPS and physician professionalism	116
6.3 Contribution and inspiration.....	116
6.4 Research limitations and improvements	117
Bibliography.....	119
Webliography	131
Annex A: Questionnaire Survey of Physician Professionalism Scale.....	133

Annex B: Questionnaire Survey of Physician Occupational Commitment Scale.....	135
Annex C: Questionnaire Survey on Hospital PFPS Scale and Physician Professionalism Scale	137
Annex D: Open Interviews.....	141
Annex E: Expert Information Sheet of Open Interviews	143
Annex F: Relevant Tables	145

List of Tables

Table 3.1 The Interview outline	38
Table 3.2 Statistics of expert interview information	40
Table 3.3 Structured data.....	42
Table 4.1 Main research perspectives, main researchers, and conclusions of physician professionalism.....	63
Table 4.2 Items of the PPI-Scale obtained from literature analysis	68
Table 4.3 Items of the PPI-Scale obtained from interviews	69
Table 4.4 The PPI-Scale	70
Table 4.5 Demographic information	72
Table 4.6 Factor matrix of the PP-Scale (n = 412).....	73
Table 4.7 Model fit of the physician professionalism scale (n = 412)	75
Table 4.8 Internal consistency reliability of factors in the PP-Scale (n = 412).....	76
Table 4.9 Matrices and validity tests for each dimension of the PP-Scale (n = 412).....	77
Table 4.10. Descriptive analysis of variables	78
Table 4.11 Regression model analysis of various dimensions of physician professionalism on physicians' occupational commitment	79
Table 5.1 Hospital compensation satisfaction dimension breakdown.....	88
Table 5.2 Physician Professionalism Scale	90
Table 5.3 Basic information of the sample (N=160).....	91
Table 5.4 Consistency coefficients for each variable and dimension.....	93
Table 5.5 Factor loadings for each variable and dimension	94
Table 5.6 Controlled variables for regression models 1-4.....	95
Table 5.7 Multiple linear regression analysis results of performance pay satisfaction on physician professionalism scores	96
Table 5.8 Regression analysis results for performance pay satisfaction dimensions on physician professionalism.....	98
Table 5.9 Regression analysis results for performance pay satisfaction dimensions on physician professionalism's definition	98
Table 5.10 Regression analysis results for performance pay satisfaction dimensions on physician professionalism's historical development	99

Table 5.11 Regression analysis results for performance pay satisfaction dimensions on physician professionalism's medical practice	100
Table 5.12 Regression analysis results for performance pay satisfaction dimensions on physician professionalism's cultivation and inheritance	101
Table 5.13 Regression analysis results for performance pay satisfaction dimensions on physician professionalism - medical and social value	101
Table 5.14 Analysis table for moderating effects of demographic, work-related, and performance pay variables	102

List of Figures

Figure 3.1 Structured data	41
Figure 5.1 Hypothetical model of the impact of hospital performance-based pay on physician professionalism.....	83

[This page is deliberately left blank.]

List of Abbreviations

Abbreviation	Full title
ABIM	American Board of Internal Medicine
ACP	American College of Physicians
CFA	Confirmatory Factor Analysis
EUIM	European Union of Internal Medicine
PFP	Pay-for-Performance
OECD	Organization for Economic Cooperation and Development
CMS	The Centers for Medicare and Medicaid Services
PQRS	Physician Quality Reporting System
SMP	State Medicaid Programs
IHAP	Integrated Healthcare Association Program
HQID	Hospital Quality Incentive Demonstration
VBP Program	Value-based Purchases Program
VRP	Physician Voluntary Reporting Program
PQRI	Physician Quality Reporting Initiative
PQRS	Physician Quality Reporting System
MIPS	The Merit-based Incentive Payment System
EHR	Electronic Health Record
SMP	State Medicaid Programs
HEDIS	Health Effectiveness Data and Information Set
AMI	Acute Myocardial Infarction
CABG	Coronary Artery Bypass Grafting
HIQR	Hospital inpatient quality reporting
MOI	Medical Outcome Indicators
CEI	Clinical Efficiency Indicators
NHS	National Health Service
QOF	The Quality and Outcomes Framework
AQS	Advancing Quality scheme
CQUIN	Commissioning for Quality and Innovation
BPT	Best Practice Tariff
FIQI	Financial Incentives for Quality Improvement
VBP	Value-based payment
PCMHs	Patient-centered Medical Homes
OCM	Oncology Care Model
PCOP	Patient-Centered Oncology Payment
CEHRT	Certified Electronic Health Record Technology
MACRA	The Medicare Access and CHIP Reauthorization Act
QPP	Quality Payment Program
PCOP	Patient-Centered Oncology Payment
ASCO	American Society of Clinical Oncology
EBM	Evidence-based medicine
CPOC	Consolidated Payments for Oncology Care
QOPI	Quality Oncology Practice Initiative
ERG	Existence、Relation、Growth

RBRVS	Resource-based relative value scale
KPI	Key performance indicators
RMSEA	Root-Mean-Square Error of Approximation
CFI	Comparative Fit Index
TLI	Tueker-Lewis Index
PFPSQ	Pay for Performance Satisfaction Questionnaire
VBHC	Value-based Healthcare
DPR	Doctor-Patient Relationship
POS	Perceived Organizational Support
LMX	Leader-Member Exchange
OCB	Organizational Citizenship Behavior
ERB	Extra-Role Behavior
ACGME	Accreditation Council for Graduate Medical Education
IIME	Institute for International Medical Education
MSAF	Multisource Assessment and Feedback
NGT	Nominal Group Technique
EFA	Exploratory Factor Analysis
MSQ	Minnesota Satisfaction Questionnaire
KMRW reputation model	Kreps, Milgrom, Roberts and Wilson reputation model

Chapter 1: Overview

With the progress of healthy China and the increasing public demand for medical services, higher requirements have been put forward for physician professionalism in the health care industry. As early as 2012, China's National Health Commission issued a notice on the Discussion on Physician Professionalism in the National Health Care System, arousing nationwide heated discussion on physician professionalism, and making it a hot topic in the health care system. Then, at the National Health Conference held in 2016, President Xi Jinping explained the connotation of physician professionalism, which is "respect for life, save the dying, heal the wounded, be willing to contribute and have boundless love". It has effectively inspired the professional mission and responsibility of major health care providers and also brilliantly interprets the connotation of physician professionalism in China.

At the same time, the global healthcare sector is facing increasing health expenditure pressure and an urgent need to improve service quality and optimize health outcomes. Many countries have widely implemented the pay-for-performance system in their healthcare sector. This system utilizes economic incentive strategies to drive the behavior of medical institutions and staff, with the goal of improving the quality, quantity, efficiency, and cost control of services. Although a large amount of research has focused on the specific impact of pay-for-performance system on healthcare quality, there is currently no conclusive evidence that it can significantly improve healthcare quality (Farias et al., 2020; Fung et al., 2008; Rowe, 2006). In view of this, some scholars proposed that future performance evaluations should be based on the professional ethics of doctors (Casalino & Khullar, 2019; Conway & Cassel, 2012; Kurnat, 2020). However, there are different opinions in the industry regarding the impact of pay-for-performance systems on physician professionalism, which has also sparked a lot of debate.

As more and more researchers pay attention to physician professionalism, to a certain extent, it strongly promotes medical service providers to strive for professional competence and the occupational mission of lower diagnosis and treatment costs with better curative effect, and finally realize the Value-based Healthcare (VBHC) (Wang, 2018). Meanwhile, it also inspires the majority of medical service providers to better understand the significance and value of their work, and take the initiative to shoulder the social responsibility entrusted by the professional mission. Studies have found that paying attention to physician professionalism not only helps

to improve the doctor-patient relationship (DPR), but also plays a supporting role in preventing medical corruption (Lu & Mao, 2019; Zhou et al., 2013). At the same time, more attention to physician professionalism can realize the technical specialization and humanistic value of medical services (Zhou et al., 2013). Based on this, this study explores the relevant factors affecting physician professionalism, which has far-reaching practical influence on the quality of medical services and the vision of healthy China.

However, the researches on physician professionalism in China started relatively late, most of which are focused on medical education for medical students (Li, 2006; Zhao, 2018). Besides, physician professionalism is easily influenced by multiple factors such as medical policy environment, hospital management system, hospital pay-for-performance satisfaction (PFPS) and perceived organizational support (POS), doctor-patient relationship (DPR), leader-member exchange (LMX), patient satisfaction (PS) (Diaconu et al., 2021; Eisenberger et al., 1986; Lu & Mao, 2019; Shu, 2021; Sun, 2015). Therefore, when building physician professionalism, the study should not only shape the internal values of physician professionalism, but also pay attention to the external environment like health policy. For example, studies have found that hospital PS and perceived organizational support can affect physicians' individual behaviors, and organizational support with higher PS can effectively promote physician professionalism (Jin, 2019; Shore et al., 2006).

Entering the new era, the traditional employment model is being subverted, and mutual benefit has become the new normal of the employment relationship between physicians and health care service organizations. Scholars have also conducted extensive studies on the relationship between physicians and health care service organizations. Health care service organizations hope physicians are willing to assume more responsibilities, while pursuing their own demands. Therefore, the academic community gradually began to propose a series of concepts such as PFPS, physician professionalism, organizational commitment (OC), organizational citizenship behavior (OCB), LMX and extra-role behavior (ERB) (Kim & Ren é, 1996; Li et al., 2022; Meyer & Allen, 1991; Yang & Fu, 2019), hoping to help leaders of health care service organizations to perform better in their management work. Among them, Jin (2019) found that the predictive power of PFPS on physician behavior was even higher than that of traditional organizational commitment or occupational commitment. It can be seen from this that simply focusing on physician professionalism is highly likely to lead to deviations in the practice. Therefore, the academic community began to pay attention to hospital PS (Bao & Liu, 2011; Jin, 2019).

At the same time, existing researches on physician professionalism mainly focus on the

influence of individual ethics, altruism, and the interactive influence of individual ethics with organizational support situations or pay-for-performance (PFP) on physician professionalism (Jin, 2019). For example, the variables of individual moral level under physician individual ethics and organizational support under hospital pay-for-performance are combined to study the influence of these characteristics on physician professionalism by constructing an interaction term for these two variables under different dimensions. Although such studies have supplemented the shortcomings of single-dimensional studies, they are still not comprehensive and lack of overall integrated thinking, because they ignore that variables affecting physician professionalism are the result of systematic integration and interaction of various factors, and these neglected factors may have a decisive impact on physician professionalism. In short, few studies have focused on the interactive or overall perspective of variables to study physician professionalism from the five dimensions, including the basic norms, new technologies, and the application of new therapies, medical practice, cultivation and inheritance, medical and social value of physician professionalism. Obviously, studies from the perspective of Chinese public hospitals integrating these five dimensions are even more scarce, and there is a lack of effective tools to measure physician professionalism. Therefore, from the perspective of physicians in Chinese public hospitals, it is of great practical significance to develop physician professionalism scale by integrating these five dimensions.

To sum up, developing a multi-dimensional integrated and interactive physician professionalism scale from the perspective of physicians in Chinese public hospitals, and exploring the relationship between each dimension of hospital PFPS and physician professionalism will improve physician professionalism and support the sound development of China's health system, so as to better realize the vision of a healthy China. Although PS is an external factor affecting physician professionalism, it is the most important component. Therefore, it is necessary and significant to explore the correlation and influence mechanism between physician professionalism and PS through the combination of qualitative and quantitative open-ended interview research. In this case, the study attempts to propose another path of constructing Chinese physician professionalism from the perspective of PS, so as to promote the early realization of a healthy China.

1.1 Research background and significance

Physician professionalism is the cornerstone of medical quality, and its core principle is patient-oriented, emphasizing the priority of patients' interests, which should always come before

physicians' personal interests (Walsh, 2011). In other words, physician professionalism is a commitment of physicians to patients and the public, including respecting patients, putting patients' interests first, keeping industry self-discipline, and achieving professional technical competence through professional training (X. Chen, 2013). Physician professionalism encourages doctors to continuously improve their professional knowledge, skills and communication ability with patients, and it also greatly improves the medical quality and guarantees medical safety of the hospital (C. Lv et al., 2020). The ultimate goal of paying attention to physician professionalism is to achieve better curative effect at lower cost of diagnosis and treatment and realize valuable health care (VBHC) (Wang, 2018). Whether patients can receive good medical services and humanistic care, as well as whether the doctor-patient relationship is harmonious, all need health care service providers to exert their professionalism. Therefore, physician professionalism is not only a powerful spiritual force that reflects the medical value, but also a powerful guarantee for people's life safety (X. Chen, 2013). At the same time, it will promote the fair distribution of medical resources, for example, emphasizing doctors' altruism, self-supervision, and commitment to scientifically improve medical quality (Li et al., 2021; Wynia, 2009).

Tracing the development of physician professionalism, the study finds that before the 1970s, physician professionalism followed the Hippocrates oath. In 1999, the United States Federal Government approved ways to fund post-graduate medical education, mostly through Medicare. Programs wanting to receive the money must be accredited by the Accreditation Council for Graduate Medical Education, or ACGME. As a result, the ACGME accreditation system has become one of the most important quality assurance mechanisms for post-graduate medical education in the United States. Through this accreditation system, the training programs of resident physicians and specialists are evaluated and improved to promote public health. In 2001, the Institute for International Medical Education (IIME) listed physician professionalism as one of the seven core competencies of doctors (David et al., 2003). In 2002, the American Board of Internal Medicine (ABIM) issued *Medical Professionalism in the New Millennium: A Physicians' Charter*, referred to as *A Physicians' Charter*. The declaration further defined the three principles of physician professionalism and refined them into ten codes of conduct (Project, 2002), which strongly explained the important role of physician professionalism in diagnosis and treatment practice.

At present, the research on physician professionalism is mainly conducted under the background of college medical education and under the background of health management system. The focuses include medical education courses, medical teaching, clinical practice and

competition, and doctor-patient relationship. However, under the background of health economy, it is rare to study physician occupational commitment and physician professionalism from the perspective of the motivation system of physicians PFP incentive system (Lesser et al., 2010). The international community does not have consistent definition of physician professionalism. At present, there are three frameworks to describe the physician professionalism, including describing physician professionalism by emphasizing the virtues or medical ethics of physicians, describing physician professionalism by emphasizing medical behavior, and describing physician professionalism by emphasizing their professional identity (Lesser et al., 2010). With the continuous increase in the cost of health care services around the world, improving health outcomes has become the most urgent need. Health systems around the world are increasingly using pay-for-performance mechanisms to motivate medical institutions and doctors, so as to improve medical quality, quantity, and efficiency and lower medical costs through the regulation of medical behavior. Researchers around the world have also carried out extensive studies on the impact of pay-for-performance on health outcomes, but these studies mainly focus on the impact of different pay-for-performance policies or plans on medical quality, and there is a lack of strong evidence that pay-for-performance incentives help to improve health outcomes (Fung et al., 2008). Scholars continue to appeal that pay-for-performance should take physician professionalism as the basis in the future, but there are full of disputes in the impact of pay-for-performance based on the hypothesis of economic man on physician professionalism (Wynia, 2009).

Theoretically, most PFP plans aim to improve medical quality, to link economic incentives with medical quality and PFP indicators, and to make PFP equally motivate physician professionalism and medical quality, thus promoting physician professionalism (Khalife et al., 2023). However, since the introduction of PFP system, there has been a heated debate about the impact of PFP system on physicians' occupational commitment and professionalism (Parker, 2011). The debate centers on two aspects: first, although PFP has an impact on both physicians' occupational commitment and professionalism, there are differences between their theoretical foundations. For example, an essay published in 2006 pointed out that PFP damages physicians' inherent motivation to some extent, causing doctors to violate their professionalism and occupational commitment for higher pay (Roland, 2006; Siriwardena, 2012). According to an article published in 2007, the PFP system is contradictory to the Hippocratic Oath (Parker, 2011), because it not only violates physicians' occupational commitment and professional beliefs, but also directly conflicts with their altruistic behavior, which is traditionally considered a strong motivation for doctors (Mitchell et al., 2000; Tim & Catherine, 2007). With the

evaluation of its expert advisory committee in 2010, the American Medical Association believed that the conflicts between the PFP plan and physician professionalism can be avoided, and physician professionalism can be encouraged through reasonable salary payment (Amir et al., 2010). Another essay published in 2017, applied the reputation model to study PFP and physician altruism, pointing out that adding the promotion of altruism in PFP plans can effectively make doctors with poor performance work harder (Mitchell et al., 2000). By optimizing the pay-for-performance system, the enthusiasm of most doctors can be effectively stimulated (Alhenaidi et al., 2023). Considering the role of spirit of self-sacrifice in physician professionalism and commitment, it is generally expected that egoism-based behaviors are not consistent with physician professionalism and commitment at all (Parsa-Parsi, 2017).

However, at the end of 2017, the eighth amendment to the Hippocratic Oath called on doctors to pay attention to their own health, life and ability to provide the highest standard of health care (Parsa-Parsi, 2017). This revision aroused physicians to pay attention to their own interests, making it morally permissible for physicians to focus on self-interest. In terms of improving medical quality, the measures of PFP are different from those of physician professionalism and occupational commitment. For example, an essay in 2015 makes a detailed distinction between them, that is, the PFP system attaches importance to theory-based external driving factors like micro-management and doctor-patient interaction, while physician professionalism attaches importance to internal driving forces based on psychological theory such as professional autonomy and patient relationship (Ashworth & Marshall, 2015). At the same time, a financial incentive report on hypertension management published in the United States in 2017 shows that the implementation of PFP system will produce positive and unexpected results, which will not only effectively promote medical groups to revise medical guidelines, but also encourage doctors to seek new ways to improve medical quality (Hysong et al., 2017). An article published in 2018 pointed out that improving the PFP system can fully stimulate the internal motivation of most physicians (Khullar et al., 2018).

Currently, the discussion on PFP system and professionalism is not comprehensive. For example, first of all, it is a mistake for some scholars to discuss a single issue from a single perspective, as they forget the complexity and the historical development of the concept of physician professionalism (Walsh, 2011). Cultural differences cause different understanding of physician professionalism (Jin, 2019). Therefore, it is unscientific and one-sided to attribute physician professionalism to altruism and morality.

To summarize, current studies are mostly based on a single perspective to explain the single-factor impact of PFP on physician professionalism. Obviously, it is unreasonable to judge

the overall impact by this. The study should discuss the impact of PFP system on physician professionalism in a more diversified way. The theoretical assumption that PFP produces incentives is the hypothesis of economic man, that is, doctors always tend to maximize their own interests, which is in contradiction with altruism and self-sacrifice. This view is so evident that it is rarely questioned. This is what many studies argue about. The PFP system regulates doctors' behaviors, and implies a hypothesis: financial incentives will increase the motivation of behavior, so the impact of PFP on physician professionalism may not only comes from financial incentives, but also from physicians' intrinsic job motivation, which is the driving force of various changes (Lalani et al., 2018). Some studies have also shown that intrinsic job motivation is related to social responsibility, trust, team cooperation and ethic (Tong & Zhao, 2018). Obviously, these elements are closely related to the physician professionalism. When the financial incentives under PFP are consistent with the incentives of physician professionalism on medical quality, it seems that PFP has a more complex impact on physician professionalism with the consideration of the inherent job motivation of doctors in practice.

Based on the existing studies, this study holds that the impact of hospital performance on physician professionalism from different dimensions should be analyzed in a more diverse way, and the theoretical mechanism behind the impact should be better discussed with the help of existing theories, qualitative interviews and quantitative analysis, so as to explore the theoretical basis and in turn, offer guidance for management practice, with the design of PFP system to promote the development of physician professionalism.

1.2 Research on the influencing factors of PFPS beyond and in China

1.2.1 Research on the influencing factors of PFPS beyond China

Scholars have conducted a lot of research on the influencing factors of PFPS, which can be divided into six categories, namely, salary level and structure, fair distribution, performance work input, the nature of work, employees' gender, age and education background. As for the specific research paradigm and content, there are some examples. Lawler (1971) took employees as the research object and it is found that employees' individual input, work input, job nature and non-monetary salary all play an important role in staff's PFPS. According to the research results of Kinicki et al. (2002), the nature and type of work will also affect PS; Williams et al. (2006) found that PS is also affected by the results of social comparison, and there is a certain positive correlation between them. Shore et al.(2006) found that, in terms of the salary

comparison among different groups, PS is more easily affected by the different ratio of internal and external pay, and, especially, the internal pay ratio demonstrates a more obvious impact. Maio (2015) adopted the cluster sampling method to collect 322 nurses from a general hospital as research samples, and conducted a questionnaire survey and applied the PFPS scale. The result found that the nurses' PFPS was at the middle or lower level, and the strongest predictor of nurses' PS was whether nurses' pay reflected labor value. Zweifel and Janus (2017a) found that nurses' PS is positively correlated with their job performance, and is related to their education background, department, average monthly income and whether salary reflects their labor value. However, nurses' job performance is the main factor affecting their PS. Bae (2023) found that the PS of medical staff has a significant positive correlation with the perceived salary justice, and negative correlation with the imbalance of the pay-to-return ratio. For example, when the salary could not reflect the labor value fairly, the perceived salary justice was poor, and the pay-to-return ratio is imbalanced, the PS of medical staff would be seriously reduced.

1.2.2 Research on the influencing factors of PFPS in China

Relatively speaking, the study of PS began late. Since 2000, scholars in China have wider research on the influencing factors of PS (Pu & Guo, 2008). As early as 2006, Wu et al.(2006) found that the PS of hotel staff is largely affected by social comparison. Ye et al. (2008) conducted an empirical study and found that there is a relationship between environmental factors and PS. Through comparative analysis, Meng et al. (2022) found that the PS of some institutions and enterprises, including universities, medical schools and scientific research institutes, is mainly affected by five factors of working environment, monetary salary, salary system, salary fairness and work value realization. The study of Ma found that the factors affecting PS also include the perfection of salary system and the rationality of salary structure.

With the in-depth study of PS, He (2013) found that, for the university teachers in western China, the factors affecting PS include educational background, professional title, external sense of fairness, monthly income and PFP system. Wan et al. (2010) found that for employees in construction enterprises, gender, age, marital status, education, position, and length of working years will have varying degrees of impact on PS (including salary level, salary structure, salary system, and salary form). Liu and Chen (2014) used both quantitative and qualitative methods in their study and it is found that for project managers of large real estate companies, salary and benefits, incentive mechanism, development prospects, interpersonal relationships and corporate identity affect their PS to a certain extent. Chen (2016) found that PFPS positively affects employees' organizational commitment, and staff's personal

characteristics play a moderating role. The study of Jin (2019) found that all dimensions of PFP have an impact on all dimensions of physician professionalism. Hu and Wu (2022) found that the PS of medical staff is affected by job characteristics (such as hospital location, hospital type, working years, title and department) and working status (such as employment form, administrative position, teaching task, workload and lounge availability). These are all important factors that affect the PS of medical staff. Rong et al. (2023) found that the PS of medical staff was affected by the perceived pay equity, pay-to-return ratio, and whether the salary reflected the value of their labor.

1.3 Research on the physician professionalism beyond and in China

1.3.1 Research on physician professionalism beyond China

At the end of the last century, mercantilism eroded the traditional physician professionalism to a certain extent, driving people to pay attention to the specific connotation of physician professionalism. Hereinafter, medical professionalism (the expression at that time) is defined as altruism, obligation of respecting patients, and improvement of medical professional competence. In 2002, *A Physicians' Charter* put forward three principles and ten guidelines for physician professionalism (ABIM Foundation et al., 2002), which defined the content of physician professionalism, marking the starting point and core of the research on physician professionalism.

The researches on physician professionalism beyond China began relatively early, and are not only about medical education, but also involves clinicians. Some researchers developed a three-dimensional scale of excellence, sincerity and altruism (Arnold et al., 1998). Subsequently, some scholars put forward nine major elements of physician professionalism (such as putting patients' interests above personal interests; establishing a high standard of morality; responding to social needs; human values such as honesty, integrity, care, compassion, respect and trust; sense of responsibility; continuous pursuit and commitment to excellence; understanding academic progress; dealing with uncertainty and complexity; reflecting on one's own actions and decisions (Swick, 2000). Lesser et al. (2010) constructed a four-dimensional framework of physician professionalism (including sympathy, respect and cooperation; sincerity and honesty, strong sense of responsibility, professional self-discipline, integrity and justice; pursuit of excellence; humanitarianism, impartiality and humanitarian management of medical resources); Brek (2009) proposed that the method of multisource assessment and

feedback (MSAF) should be used to provide more reliable conclusions for the study of physician professionalism.

At the same time, researchers beyond China have developed a large number of physician professionalism scales. Among them, the representative ones are Mini Clinical Examination Exercis (Mini CEX scale) developed by Norcini and John (1995) and Professionalism Mini-Evaluation Exercise (P-MEX scale) developed by Cruess et al. (2005). The P-MEX scale, with strong operability, high reliability, validity and flexibility, is known as the only effective scale for the evaluation of physician professionalism of resident physicians in western countries and East Asia (Lu & Mao, 2019); Campbell et al. (2007) and Roland et al. both developed scales according to *A Physicians' Charter*. Campbell et al. (2007) studied the professional attitude and behavior of 3504 doctors and found that the professional behaviors and attitude of doctors are not completely consistent. Roland et al. (2011) pointed out that there are differences in physician professionalism among different health systems, and the reform of medical system will affect physician professionalism.

1.3.2 Research on physician professionalism in China

In 2006, China formally signed the *Medical Professionalism in the New Millennium: A Physicians' Charter*. Then, the word professionalism was introduced into China from western countries, and many studies on this topic began to emerge. For example, Du (2007) believed that medical science is not only a profession, but also a major, so he translated it as medical professionalism. This definition has been basically recognized. Then, a large number of studies emerged in China. Representative works include *Medical Professionalism* by Li (2006), *Ethics Spirit: An Analysis of Medical Professionalism and the Kernel Words of Its Reconstruction* by Sun (2006), and the *Correspondence between the Confucian Thought of "Wuchang" and the Medical Professionalism* by Qu and Wang (2010). Although the content of their research is not completely consistent with that of *A Physicians' Charter*, there is no difference in their connotations. Through examination and comparison, it is found that the connotation of the above research is more in line with the Chinese philosophy of doctors' excellence in both profession and morality and the medical practice of China at that time. Later, the doctoral thesis of Bu (2015) summarized two translation versions and holds that medical professionalism and physician professionalism are essentially two concepts, in which the core of physician professionalism is the medical value and morality of being excellent in both profession and morality, where righteousness trumps profits, while medical professionalism is the core of western concept, that is, conflict of interest and industry autonomy, where profits trumps

righteousness. In 2012, China's National Health Commission issued the notice on *National Discussion on Physician Professionalism in the Medical and Health System*. However, at present, there are still different translations of physician professionalism, each of which reflects a different interpretation. In 2011, the Chinese Medical Doctor Association issued the *Chinese Medical Doctor Declaration*, whose expressions are more in line with the Chinese language characteristics. The core spirit emphasized is equality and benevolence, patient first, sincerity and trustworthiness, diligence and prudence, honesty and justice, and lifelong learning. Although the focuses of the two documents are different, the *Chinese Medical Doctor Declaration* has a common basis with the universally applied *Medical Professionalism in the New Millennium: A Physicians' Charter*, both of which emphasize the principles and importance of patient-oriented. These principles advocate the supremacy of patients' interests, doctors' scientific ability, doctors' integrity and social fairness and justice.

To sum up, the translation "medical professionalism" is much in line with the meaning conveyed by *Medical Professionalism in the New Millennium: A Physicians' Charter*, and the translation of "physician professionalism" is closer to the core spirit conveyed by the *Chinese Medical Doctor Declaration*. Therefore, Chinese doctors tend to accept the translation of "physician professionalism". Thus, this study adopts the translation of "physician professionalism".

Ye et al. (2008) created the earliest scale of physician professionalism to measure the professionalism of physicians in southwest China, in which three basic principles and ten basic guidelines in the *Medical Professionalism in the New Millennium: A Physicians' Charter* were used as survey tools but no specific items were compiled. Later, Liang et al. (2011) developed a seven-dimensional evaluation index scale of professional behavior of medical students, and later the scale was further improved by Li et al. (2014) and was cited by many studies on the professionalism of medical students (J. X. Lv, 2020). Ho et al. (2011) a scholar from Taiwan, China, used nominal group technology (NGT) to set up a committee of 91 professionals from 12 disciplines to establish a medical professional framework of the National Taiwan University, College of Medicine (NTUCM). The framework includes eight competencies, including integrity, responsibility, ethics, the pursuit of excellence, communication skills, humanitarianism, altruism and clinical competence. Among them, clinical ability, communication ability and ethics are the three foundations, while humanitarianism, the pursuit of excellence, altruism and responsibility are the four supporting pillars. This study only obtained the professional framework of physician professionalism, but did not form a complete measuring scale; Zhou (2014) developed a five-dimensional (including professional attitude,

cognition, self-discipline, responsibility and ideal) physician professionalism scale; based on the two physician professionalism scales of Campbell et al. (2007) and Roland et al. (2011), with reference to the three principles and ten basic duties demonstrated in the *Medical Professionalism in the New Millennium: A Physicians' Charter* and with the consideration of China's medical environment, J. Chen et al. (2013) developed a two-dimensional physician professionalism scale which included professional attitudes (improving the quality of medical service, improving professional ability, being honest with patients, keeping patients confidential, promoting access to medical care, fair distribution of resources, being responsible for scientific knowledge, being responsible for occupation and patients' interests first) and professional behavior (improving the quality of medical service, improving professional ability, being honest with patients, keeping secrets for patients, promoting access to medical care, fair distribution of limited medical resources, responsibility for occupation, and maintenance of trust by resolving conflicts of interest. Based on the *Chinese Medical Doctor Declaration*, Chen (2015) constructed a conceptual model of physician professionalism in six dimensions of sincerity and trustworthiness, equality and benevolence, patient supremacy, diligence and prudence, honesty and justice, and lifelong learning. Xu and Yuan (2016) interviewed with doctors and patients in eight grade A tertiary hospitals in Shanghai and found that the top three elements of physician professionalism were responsibility, respect for patients and empathy; Shi (2018) used the six-dimensional physician professionalism scale of Pennsylvania State University to measure physician professionalism (duty, respect, responsibility, altruism, self-improvement and integrity); C. Lv et al. (2020) developed the five-dimensional measurement scale of physician professional behavior (enterprising, dedication, responsibility and justice, respect and empathy, honesty and integrity).

In the empirical study of physician professionalism, scholars in China have concluded that there is a relationship between physician professionalism and many antecedents, and there are some representative studies. J. Chen et al.(2013) found that the degree of doctors' participation in decision-making would affect their professional behaviors. Based on theoretical analysis, Lu et al. (2013) mentioned that DPR would affect physician professionalism. Yu et al. (2013) confirmed through empirical research that organizational psychological contract, patient feedback and personality traits will affect physician professionalism. Zhou (2014) found that there is a significant positive correlation between physicians' PS and their professionalism. Tan (2017) found that the department atmosphere has a significant impact on physician professionalism; Zhang (2017) found that the spiritual or institutional culture in hospital would affect physicians' professional attitude, and the negative evaluation of organizational culture

would affect their professional behaviors. Shi (2018) found that each dimension of physician professionalism is related to the practice environment.

1.4 Research objectives and contents

1.4.1 Expert interview research

Based on the framework of hospital PFPS and physician professionalism, this study extracted 11 open interview topics centering on physician professionalism (see Annex A) and conducted face-to-face interviews with 25 selected medical experts to obtain qualitative data. Through coding and classification of the data, this study extracted factors related to both the internal values and external environment that affect physician professionalism, and further study the relationship between physician professionalism and hospital PFP. The qualitative research delves into the specific relationship and mechanism of the different aspects of PFP and PS on the physician professionalism, and reform measures to optimize the hospital PFP system are proposed. To enhance physician professionalism, the study should 1) strengthen the positive incentive of hospital PFP; 2) increase the spiritual incentive and invisible welfare of physicians; 3) integrate the construction of physician professional ethics with physician professionalism, and improve the hospital PFP system.

1.4.2 Developing of the physician professionalism scale

This study developed the physician professionalism scale through the following methods. 1) Collecting and sorting out the existing literature on physician professionalism, systematically reviewing and summarizing its core concepts and constitutional dimensions, and effectively identifying and systematically integrating to summarize various important factors and theories from various perspectives that affect physician professionalism. Effectively distinguishing and systematically integrating these factors and theories to construct the core conceptual dimension of physician professionalism. 2) This research uses interview and questionnaire to develop a scale of physician professionalism in line with China's national conditions, which includes five dimensions: basic norms, new technologies, and the application of new therapies, medical practice, cultivation and inheritance, and medical and social value of physician professionalism, and carries out Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to test the reliability and validity of the scale. 3) Conducting quantitative research to compare theoretical relations and establishing research hypotheses. 4) Verifying the impact of various

dimensions of physician professionalism on physician occupational commitment, and discussing the application and enlightenment of this scale in the future.

1.4.3 Quantitative study on the relationship between PFPS and physician professionalism

The mature scale of PFPS with 18 items in four dimensions (overall level, salary increase, welfare and salary management) and the 20-item scale of physician professionalism with five dimensions (basic norms, new technologies, and the application of new therapies, medical practice, cultivation and inheritance, medical and social value) developed and initially verified in this study are used as the main questionnaire (see Annex B and C), and demographic information (gender, age, education level, professional title, years of work, department), performance-pay ratio and working status (average number of overtime per-month, average number of night shifts per month, average daily sleep duration) are used as control variables to conduct regression analysis and test the moderating effect.

Chapter 2: Theoretical Basis of the Research and Its Relevance

2.1 Hospital pay-for-performance satisfaction

2.1.1 Concept and theoretical basis of hospital pay-for-performance satisfaction

Pay Satisfaction (PS) is the employee's attitude towards salary. He (2013) argues that pay satisfaction is an emotional experience, which is the sum of employees' emotional perception of the difference between the expected salary and the actual salary; Micedi and Heneman (2000) believe that PS is the sum of employees' positive or negative emotions on the salary they receive. Hospital Pay Satisfaction refers to medical workers' overall feeling of satisfaction or dissatisfaction in medical institutions after comparing the salary obtained through their own work with their own expectations, and it is the direct reflection of medical workers on factors such as salary level and salary structure (Herbert & Donald, 1985). The theoretical basis of pay satisfaction and hospital pay satisfaction is the Social Justice Theory (SJT) and Difference Theory (DT), and the theoretical models of pay satisfaction mainly include the justice model, difference model and adjustment gap model (Herbert & Donald, 1985).

The theoretical basis of pay satisfaction is the Justice Theory, which is a motivation theory proposed by the famous American psychologist Adams (1965) in his book. According to this theory, people not only care about the absolute value of their compensation, but also the relative value of their compensation. It is the subjective feeling that this theory is concerned about, and the necessary condition for people to generate a sense of justice is objective justice. Assuming that all people pursue justice, people will find ways to restore a sense of justice when they encounter unfair treatment (Adams, 1965). In short, the purpose of this theory is to study and discuss whether the salary distribution is reasonable and fair and can affect the enthusiasm of employees when the conditions are consistent. The primary argument of this theory is that employees tend to pay more attention to the absolute value and relative amount of salary and compensation when they eventually achieve results and obtain salary and compensation. The conclusion of this theory is divided into two parts: On the one hand, there is a horizontal comparison, that is, employees themselves will compare the "output/input" ratio at work with people in the same position in the organization, and only when the result is equal to others will they feel fair. On the other hand, there is a vertical comparison, that is, comparing one's current

“output / input” ratio with one’s past, which is only fair when the two are nearly equal (Barber & Simmering, 2003; Miceli & Heneman, 2000). It is expressed as $O_A / I_A = O_B / I_B$, where O_A and O_B are the remuneration of the person and the one the person compares with respectively, and I_A and I_B are the contributions of the person and the one the person compares with respectively. The sense of justice is formed on the condition that this equation is established. However, it needs to be emphasized that at any time, managers should not take absolute justice as a management goal, which is only an impossible ideal, because people who “think that they have suffered a loss if they cannot gain extra advantage” still have a sense of injustice under the actual justice system. Therefore, managers should make full use of this psychological trait as long as they ensure that the procedures and mechanisms are fair, even if a small number of unfair results are acceptable.

2.1.2 Measurement of pay satisfaction

So far, there are two ways to measure PS, namely Adhoc Measurement and Standard Measurement (Ayoub et al., 2018). These two ways are used to measure the transformation of Pay Satisfaction from a single dimension to a multi-dimensional and to measure pay satisfaction. In the early research, the Adhoc Measurement occupies an absolutely dominant position. It is a measurement method where researchers set a random question according to actual needs to achieve pay satisfaction. The disadvantages of this measurement method are mainly that the questions are randomly designed and the results are not comparable with each other. Standard Measurement refers to the measurement of pay satisfaction with a scale, which is represented by the Job Descriptive Index (JDI) from the Minnesota Satisfaction Questionnaire (MSQ) and the salary subscale of Kinicki et al. (2002). These two scales mainly measure satisfaction with salary level. Another one is the Pay Satisfaction Questionnaire (PSQ). This scale has been verified by a large number of empirical evidence to be highly accurate, which is mainly used to measure pay satisfaction.

2.1.3 The role of pay satisfaction

In the Motivation Theory, Pay Satisfaction is a very important factor. Some scholars have pointed out that employee satisfaction is affected by the company’s performance (Burrell et al., 2022), and there is a significant positive correlation between job satisfaction and job performance (Aeon et al., 2021). Researches by Bateman and Organ (1983), and Omboni et al. (2019) found that employees with high satisfaction better demonstrated dedication, resulting in

positive dedication behavior; research by Levitan and Davis (1951) showed that improving employees' satisfaction can improve their loyalty, sense of collective honor, discipline and interest in work, and these behaviors or attitudes are closely related to physician professionalism in the medical work environment. Therefore, Pay Satisfaction strongly influences employee behavior, and in the medical environment, it also affects the professional attitude and professional behavior of physicians.

Under the different frameworks of pay-for-performance and physician professionalism, the Motivation Theory can not only effectively explain the impact of hospital pay-for-performance on physician job satisfaction, but also highlight clinician satisfaction in the process motivation theory, because clinician satisfaction is also an important process factor. Although the Motivation Theory in the early period focused on different aspects of the motivation process, with the continuous expansion of the research on the Motivation Theory, some researchers have tried to integrate various motivation theories together (including the relevant elements of different basic theories) and explain the process of motivations. For example, the German-American psychologist Kurt Lewin proposed the "Field Dynamic Theory (FDT)" (Burnes & Cooke, 2013), emphasizing that behavior is the result of internal factors and the external environment, in which external causes act through internal factors, and human needs are internal needs.

In addition, American behavioral scientists Porter and Lawler (1968) integrated extrinsic motivations and intrinsic motivations, incorporated variables such as personal ability and feelings into the expectancy motivation model, and proposed the Porter-Lawler's Expectancy Model (PLEM). In the whole model, the motivation process of "motivation-effort-performance-satisfaction" is formed, and "satisfaction" can form new motivations to constitute a closed-loop cycle. The representative theories of the expectancy theory model also include the comprehensive theory of Locke and Latham, which combines the Expectancy Theory and Goal Setting Theory to establish a motivation model. Based on PLEM, Locke and Latham further analyzed the relationship between satisfaction and behavior. Under the comprehensive theory model, financial stimulus affects employee performance behavior by influencing employee goal selection and creative self-efficacy (CSE), ultimately affecting employee satisfaction (Richter et al., 2012). Satisfaction affects employee job involvement and organizational trust, and satisfaction is a key factor in determining employee behavior in the organization (Locke & Latham, 2011).

In summary, in the Motivation Theory, satisfaction is the key element of performance on the behavior of individual employees, which is not only the result of performance motivations,

but also the source of incentive for generating new motivations. Satisfaction plays an important role in the influence of hospital performance on physician professionalism, and it is necessary to conduct an in-depth exploration of the satisfaction factors affecting physician professionalism.

2.2 Relationship between physician professionalism and pay-for-performance

Physician professionalism is a complex collection of concepts, and its connotation is very broad, so it has not yet formed a unified substantive concept across different eras and different cultural backgrounds, but there are some relatively constant elements to explain the essence of physician professionalism. For example, in 2002, an initiative was jointly launched by the American Board of Internal Medicine (ABIM), the American College of Physicians (ACP), and the European Union of Internal Medicine (EUIM), and the *Charter on Medical Professionalism: Medical Professionalism in the New Millennium: A Physicians' Charter* (abbreviated as *A Physicians' Charter*) was first published in the journal *Annals of Internal Medicine* and *The Lancet* (Project, 2002), which proclaimed three basic principles and ten codes of conduct. The three basic principles: putting the interests of patients first, patient autonomy, and social justice; the ten codes of conduct: the responsibility of physicians to improve their professional competence, the responsibility to be honest with patients, the principle of confidentiality for patients, the responsibility to maintain appropriate relationships with patients, the principle of improving the quality of care, the responsibility to promote access to care, the principle of equitable distribution of limited resources, the responsibility for scientific knowledge, the responsibility to maintain trust by resolving conflicts of interest, and the responsibility for duty (Project, 2002). These principles and codes of conduct have been highly recognized by a wide range of physicians in the international community.

With the introduction of the pay-for-performance policy in the medical and health service system, relevant researchers have also applied the Motivation Theory to the motivation of hospital pay-for-performance to clinicians, and there are also studies to explore the impact on the physician professionalism. The physician professionalism is a complex concept that has not yet been clearly defined, and its connotation changes with the change of researchers' interests. When sorting out the literature on the impact of hospital pay-for-performance on physician professionalism, the researcher adopts the three perspectives of physician professionalism proposed by David Irby (The Lancet, 2021). These three perspectives are grounded on ethic

perspective, behavior perspective, and the clinician professional identity perspective (CPIP) (Irby & Hamstra, 2016).

From the ethic perspective, physician professionalism emphasizes virtue, humanism, and ethics (The Lancet, 2021), and its actions are the result of right values and ethical principles, which prioritize intrinsic values and motivations. The Internal Motivation Theory is generally used to explain the effect of external motivations (such as money or material stimuli) on internal motivations. For example, a qualitative study of performance policies in the UK Quality Outcomes Framework noted that physicians put salary before patient interests, reducing physician professionalism (Lester et al., 2013). Godager and Wiesen (2013) found that compared with capitation, the behavior of Chinese medicine students with pay-for-performance reflects their opportunity to increase income rather than the opportunity to provide health services to patients.

Under the behavior perspective, physician professionalism emphasizes the measurement of clinicians' behavior and competence, focusing more on how clinicians exhibit their own behavior under the pay-for-performance system. Expectation theory and behavioral reinforcement theory are generally used to explain the behavioral motivation of clinicians. For example, to study how clinicians make trade-offs between performance rewards and patient interests (Hennig-Schmidt et al., 2011), or to study how clinicians distribute performance in different ways such as fee-for-service and capitation differences in the provision of medical services (Brosig-Koch et al., 2015). and behavioral reinforcement theory are generally used to explain the behavioral motivation of clinicians. For example, to study how clinicians make trade-offs between performance rewards and patient benefits (Hennig-Schmidt et al., 2011), or study the differences in the delivery of care by clinicians under different performance allocation methods, such as pay-for-service and capitation (Brosig-Koch et al., 2015).

In the context of the clinician professional identity perspective (CPIP), physician professionalism emphasizes social identity and identity formation (Cruess et al., 2014, 2015). Some researchers have pointed out that financial penalties for performance can undermine physicians' autonomy and self-efficacy (Gagné & Forest, 2008). Some studies have shown that pay-for-performance may also be associated with the satisfaction of psychological needs, thereby affecting clinician identification (Cassel & Jain, 2012).

To sum up, the study of the ethic perspective focuses on the internal personality characteristics of physicians. Under the framework of ethics, physicians restrict their own behaviors through ethics and show the characteristics of compassion, esteem and humanism. The study of behavior perspective is based on the complex and observable behaviors of

physicians. Under the framework of behavior perspective, it emphasizes the behaviors and goals of physicians. Excellent physicians show good ability in patient-centered medical services. Under the framework of CPIP, it emphasizes the formation and identification of professional identity. In general, the ethic perspective, behavior perspective and CPIP will highlight some elements of physician professionalism. The Motivation Theory is the core theory in behavioral science that links the relationship among needs, motivations, goals and behaviors. It not only links performance with results as the theoretical basis of hospital pay-for-performance, but also provides theoretical explanations for clinicians' motivations, goals and behaviors. Under different frames of physician professionalism, hospital performance can be linked with physician professionalism, so the Motivation Theory is a useful theoretical mechanism to deal with and explain the influence of hospital performance on physician professionalism. As suggested by relevant research, when evaluating individual physicians, the physician professionalism should include the internal personality characteristics, the clinician's complex cognition, the attitude elements, the occupational commitment, the job burnout, and the behavioral manifestations of interactions with the environment (David et al., 2011). In this study, physician professionalism refers to the individual attributes reflected in a set of complex personality traits, behaviors or cognitions of physicians, including sympathy, esteem, cooperation and communication, honesty, probity, responsibility, pursuit of excellence, adherence to ethical standards, equitable distribution of medical resources, fulfillment of humanitarian and other elements.

2.3 Hospital pay-for-performance

Pay-for-performance (PFP) aims to enable continuous improvement in the quality of care through financial motivations (Diaconu et al., 2021), linking financial payments to quality of care, and is often defined as providing physicians with financial motivations based on their performance in certain performance indicators. Under the pay-for-performance theory, health service providers will make more efforts to improve the quality of health care (Mathes et al., 2019; Siddiqui et al., 2018). Since its rise in the 1980s, pay-for-performance has been increasingly adopted in member countries of the Organization for Economic Cooperation and Development (OECD). For example, pay-for-performance was first implemented in the United States, Australia, Japan and European countries (Mendelson et al., 2017; Milstein & Schreyoegg, 2016). As pay-for-performance modalities vary across countries and regions, and evidence for its effectiveness remains unclear, only a subset of pay-for-performance programs

show a better effect on the quality of care (Carr et al., 2018; Cattel et al., 2020; Garrison et al., 2013; Ogundeji et al., 2016).

Looking back to the continuous progress of China's medical and healthcare system reform, the researchers have done a lot of exploratory work. For example, in September 2009, the Central Committee of the Communist Party of China and the State Council issued the *Opinions on Deepening the Reform of the Medical and Health System*, referred to as the *Opinions*, which decided to implement the reform of the pay-for-performance system in China's public health and primary medical and health institutions and other public institutions; in the same year, the Ministry of Health of the People's Republic of China and other ministries and commissions issued the *Notice on Printing and Distributing the Guiding Opinions on the Pilot Reform of Public Hospitals*, referred to as the *Notice*, which announced that from October 2009, the job pay-for-performance system will be implemented on the basis of deepening the reform of the personnel system of public hospitals; in 2015, the General Office of the State Council issued the *Guiding Opinions on the Pilot Comprehensive Reform of Urban Public Hospitals*, emphasizing that a scientific performance appraisal system should be established to link the performance appraisal results of medical staff with individual salaries.

In the following, this study reviews representative pay-for-performance programs in the United States, the United Kingdom, and other countries. This study also summarizes the characteristics and common experience of pay-for-performance programs in developed countries in Europe and the United States, and provides a reference for the reform of pay-for-performance in Chinese hospitals.

2.3.1 US pay-for-performance programs and their development

At the beginning of the 21st century, there emerged a pay-for-performance medical payment model in the United States. As of 2007, there were 148 pay-for-performance programs in operation nationwide. Most pay-for-performance programs in the United States are implemented by Medicare and the Centers for Medicare and Medicaid Services (CMS) or commercial insurance companies. These programs are broadly divided into two categories: one is performance motivation programs for clinicians; the other is performance programs for hospitals. The more famous ones among the former are the Medicare Physician Quality Reporting System (PQRS), State Medicaid Programs (SMP), and the California Integrated Healthcare Association Program (IHAP), and the representative ones among the latter are the Hospital Quality Incentive Demonstration (HQID), and the Medicare Hospital VBP Program (VBP Program).

(1) PQRS. PQRS originated as a Physician Voluntary Reporting Program (PVRP) developed by Medicare and the Centers for Medicaid Services (CMS) in 2006, which improves the quality of care by rewarding physicians for actively reporting quality indicators (Wijsenbeek et al., 2023). PVRP subsequently made some adjustments in terms of the number of treatments, reporting mechanisms and bonuses. Since 2015, PVRP has evolved into the Physician Quality Reporting Initiative (PQRI), which includes performance-based penalties and value modifiers, and eventually developed into the Pay-for-performance Physician Quality Reporting System (PQRS) (Roberts et al., 2018; Wijsenbeek et al., 2023).

(2) MIPS. In 2010, the United States began implementing the Value-Based Modifier (VBM) program (Roberts et al., 2018), which adjusts medicare payment amounts based on outcome and cost metrics. In 2018, the system was replaced by MIPS, which linked insurance payments to composite scores of outcomes, use of medical resource resources, improvement of clinical outcomes, and use of Electronic Health Record (EHR), adjusting medicare payment amounts by about 4% according to the composite score, and the adjustment rate increased year by year, aiming to reach 9% by 2022 (Roberts et al., 2018).

(3) SMP. Studies have shown that as of 2006, more than half of state medicaid programs (SMPs) included pay-for-performance programs (Elliott et al., 2016). The most common is the pay-for-performance program, which combines the Health Effectiveness Data and Information Set (HEDIS) metric to evaluate the performance of healthcare organizations, with most programs focusing on children, adolescents and women's health issues.

(4) Commercial insurance companies and private individuals in the United States also have pay-for-performance programs, the more representative of which is the California IHAP. The IHAP program was the first privately established pay-for-performance program. The IHAP quality assessment mainly includes clinical quality, medical resource use and patient experience, and the evaluation content is mainly related to cardiovascular health measures (Gettel et al., 2022). Studies have shown that hospitals with IHAP perform better on average than other hospitals by comparing the National Health Effectiveness Data and Information Set Index (HEDIS), which has a small impact on the quality of care (Greenberg et al., 2021).

(5) The Medicare and CMS implemented the Hospital Quality Incentive Demonstration Program (HQID) from 2003 to 2009. HQID mainly involved 34 performance indicators: three diseases of Acute Myocardial Infarction (AMI), Heart Failure and Pneumonia, and two surgical procedures of Coronary Artery Bypass Grafting (CABG) and total hip/knee replacement (Ryan et al., 2012). About 250 hospitals in the United States participate in HQID progress, and the top 10% to 20% receive 2% to 1% bonuses (Ryan, 2009). Between 2003 and 2006, hospitals

became qualified if they ranked among the top 20% on performance indicators, which increased performance rewards. The Medicare invested \$48 million to pay motivation funds, but there was insufficient evidence of the effectiveness of HQID (Viganego et al., 2021). A study of AMI patients showed that only two of the nine program evaluation indicators were effective in improving patient outcomes (Viganego et al., 2021). Studies have also shown that HQID has no significant impact on 30-day mortality in patients with myocardial infarction (Ryan, 2009). Studies have suggested that the main reason for promoting quality improvement is the provision of public reporting in HQID (Pollock & Dowdy, 2023). HQID has provided the strongest motivations for hospitals in the middle ranking, but is less effective for lower-ranking hospitals (Ryan et al., 2012).

(6) Medicare Hospital Value-Based Purchases (VBP) scheme. Based on the HIQR, the Medicare Hospital VBP scheme was established in 2010. Using the infrastructure of the HIQR scheme and introducing the VBM scheme for emergency inpatient services, the VBM scheme retains 1% to 2% of medicare payments as an incentive payment fund, which is then allocated to hospitals based on their total performance score (Leung et al., 2021). The overall performance score includes clinical care process and patient experience surveys, and between 2014 and 2015, the VBM scheme added Medical Outcome Indicators (MOI and Clinical Efficiency Indicators (CEI), whose criteria, weights and structures are also constantly adjusted (Banerjee et al., 2019; Norton et al., 2022). In 2016, with nearly 3,000 hospitals in the United States participated in the VBM scheme. The overall medicare payment adjustment was between $\pm 0.4\%$, with the worst-performing hospitals deducting 1.75% of their set-aside while the best-performing hospitals having a net increase of about 1.25% of their set-aside (Banerjee et al., 2019). Studies have shown a lack of evidence to support improvements in clinical quality or patient experience in the VBM scheme (Ryan et al., 2015).

2.3.2 UK pay-for-performance programs and their development

As of today, pay-for-performance schemes have been widely used in the UK for more than a decade. The National Health Service (NHS) introduced the Quality and Outcomes Framework (QOF) in primary care in 2004 (Roland, 2004) and the Advancing Quality scheme (AQ) in secondary healthcare in 2008 (Stone et al., 2022), which was subsequently incorporated into the Commissioning for Quality and Innovation (CQUIN) in 2009 and 2010. The Best Practice Tariff (BPT) incentive scheme was also launched in 2010 (Chang et al., 2023).

(1) In 2004, the UK introduced performance motivations in primary health care and established a Quality and Outcomes Framework (QOF) for general practitioners. Under this

QOF, an evaluation index system (EIS) for evaluating medical quality and services has been developed. The EIS includes two parts, public health services and medical services, and initially includes 146 assessment indicators, including disease management, organizational management (such as medical record information, education and training, and communication with patients), reception time, other supplementary medical services (such as maternity examination) and service quality, with a total of 1050 points (Liao et al., 2020). The EIS is adjusted and revised according to the actual situation, and in the latest version of the QOF evaluation system, 77 assessment indicators are included, including 12 indicators of public health services and 65 indicators of medical services, with a total of 124 points (Liao et al., 2020). According to the quantitative score in the indicator system, the financial compensation and rewards of general practitioners across the country are carried out, and statistics show that 30% of general practitioners in the UK receive financial compensation through QOF (Liao et al., 2020).

(2) Since 2010, the NHS has launched the BPT schemes, which aim to reduce inappropriate healthcare costs and improve the efficiency of health services. BPT defines best medical practice as healthcare services that are both clinically effective and cost-effective. The BPT schemes are similar to the value-based healthcare (VBHC) model described by Wang (2018) in his doctoral dissertation, which emphasizes better efficacy and lower cost. However, there is no unified definition of the BPT schemes, which tries to develop a specific evaluation model for each planned disease area that incentivizes and compensates for high-quality healthcare services by setting reasonable price lists. From 2010 to 2011, the NHS launched four BPT schemes, including cataract treatment, cholecystectomy, hip fracture care, and stroke therapy. In 2011-2012, BPT schemes included hemodialysis, interventional operation, pediatric diabetes, total hip, knee arthroplasty, Cerebral Ischaemia Treatment (CIT), and cholecystectomy (Jin, 2019), and then promoted to day-operation in orthopedic and urology surgery such as mastectomy and hernioplasty. In 2012-2013, bedridden care, outpatient examinations, hemodialysis, and assisted peritoneal dialysis (APD) were introduced, and BPT schemes such as interventional operation, day-operation, and pediatric diabetes were expanded (Jin, 2019). After the implementation of BPT schemes, studies have shown that the effects of different clinical areas are inconsistent, which is related to the heterogeneity of BPT scheme designs in different disease areas (Jin, 2019).

(3) Performance reward scheme of Advancing Quality scheme (AQS). In October 2008, AQS was first piloted by the British Ministry of Health (BMH) in 24 of its hospitals in the North West of England, and the scheme covers five medical fields: knee arthroplasty, coronary

artery bypass grafting (CABG), AMI, pneumonia, and heart failure. In the five medical fields, the relative performance of 24 hospitals was evaluated based on 23 index data of the hospitals, and the top 25% received a bonus of 4% of the revenue in this medical field, and 26%-50% received a 2% bonus, which was distributed to the well-performing clinical treatment team to improve the clinical treatment environment (Liao et al., 2020). In its first year of implementation, studies have shown that the program significantly reduces risk-adjusted mortality (Stone et al., 2022).

(4) In 2009-2010, AQS was included as a UK national programme in the CQUIN, which covers emergency care, community medicine, mental health and ambulance services, including medical safety, quality of care, patient experience and medical innovation. The main features of AQS: First, specific performance indicators are not uniformly developed nationally, but are agreed upon by local medical regulators and healthcare providers (Liao et al., 2020). Second, AQS uses set-aside funds instead of bonuses to withhold some payments from healthcare providers in advance, and if providers fail to meet quality targets, they cannot access the entire budget. Studies have shown that there is no conclusive evidence that CQUIN improves the quality of care (Saint-Lary et al., 2013).

2.3.3 Pay-for-performance programs in other countries and their development

Financial Incentives for Quality Improvement (IFAQ) in France. In 2012, the French-Ministry-of-Health began piloting and testing IFAQ in 222 hospitals across the country, and in 2016 it was rolled out to all emergency hospitals. The evaluation content of IFAQ covers the entire medical process, including 16 indicators such as medical quality and safety, hospital accreditation standards, electronic medical records and others. The scores of individual indicators are obtained by adding and adjusting “performance scores” and “progress scores”. After the expert group determines the weight of each indicator, the total score is calculated by weighting, and hospitals with a ranking greater than 50% will receive economic rewards according to the ranking and budget (Milstein & Schreyoegg, 2016). Some studies have shown that although the medical quality of all participating hospitals has improved, no significant impact of incentive measures on hospital scores has been found (Lallou ét al., 2017). Countries such as Germany and New Zealand have also implemented a number of performance-based pay programs, and studies have shown that in the Organization for Economic Co-operation and Development (OECD) countries, as of January 2016, at least 34 pay-for-performance schemes are in place in 20 of the 35 OECD countries (Milstein & Schreyoegg, 2016).

2.4 Value-based oncology payment mode in the United States

2.4.1 Overview of value-based payment mode

The US healthcare system is motivating healthcare service providers (including healthcare institutions and staff) through a value-based payment (VBP) mode, which replaces the medical services quantity with their value and quality (American Hospital Association, 2019). The payment strategy in the VBP mode is to motivate medical service providers to improve their medical services quality, while helping reduce patients' medical expenses by adopting the medical quality evaluation system, with a combination of its reward and punishment mechanism, thus realizing the VBHC (Milstein & Schreyoegg, 2016). The common VBP mode in the United States encompasses Bundled Payment, Patient centered Medical Homes (PCMHs), Accountable Care Organizations (ACOs) and other types (Deloitte Center for Health Solutions, 2016).

2.4.2 Value-based oncology payment mode

The United States is piloting a value-based oncology payment mode for tumor patients to elevate the cost-effectiveness of oncology-related medical services. Typical pilot modes include Oncology Care Mode (OCM) and Patient Centered Oncology Payment (PCOP) Mode. OCM is a retrospective Bundled Payment mode established by Medicare and CMS for Medicare chemotherapy patients, aiming to transform the oncology medical service mode to improve medical quality, which was piloted from July 2016 to June 2021 (Centers for Medicare and Medicaid Services, 2020). This payment mode is based on a framework of treatment events and its service scope chiefly covers chemotherapy and relevant medical services from the first chemotherapy till those in the following six months. OCM acts as a composite payment mode consisting of a fixed patient management fee per person per month and a performance-based payment.

In respect of service content, OCM stipulates that the treatment event involves chemotherapy and related medical services from the beginning of the first chemotherapy to those in the subsequent six months. Moreover, the determination of the first chemotherapy is based on the patient's initial adoption of specific chemotherapy drugs, with a duration of six months. The services covered are all medical services stipulated by Medicare Part A and Medicare Part B, as well as medicine expenditures in Medicare Part D. In addition, OCM emphasizes the practice of services by medical institutions from three aspects: the first aspect

is to offer enhanced services (including providing patients with 24-hour doctor consultation services, recording specialized care plans for each patient, and providing treatment services to patients according to nationally recognized clinical guidelines); the second is to use Certified Electronic Health Record Technology (CEHRT), which should comply with the Quality Payment Program (QPP) requirements of the Medical Access and CHIP Re-authorization Act (MACRA); the third is to employ data for continuous quality improvement, indicating that medical institutions have to collect and report clinical and quality data to CMS, which will provide feedback reports to help medical institutions carry out continuous quality improvement activities (Liao et al., 2020).

The payment method of OCM is made up of two parts: one is to pay patient management fees per person per month, aiming to drive medical institutions to provide patients with comprehensive and effective medical services at a payment standard of 160 US dollars per person per month (Liao et al., 2020); the other is pay-for-performance, which aims to motivate medical institutions to control medical costs and improve service quality. The calculation of performance rewards is on the basis of the medical services quality and the reduction of medical expenses, and its retrospective calculations are conducted every six months (Liao et al., 2020).

When executing the pay-for-performance, CMS first calculates the benchmark price of treatment events based on historical data. The benchmark price is adjusted for risks, trends, and new therapies. The risk-adjusted factors encompass age, gender, medicaid, medicare eligibility, specific non-cancer-related complication, and specific cancer-related surgeries, Bone Marrow Transplant (BMT), radiotherapy, chemotherapy drug types, as well as Tumor Node Metastasis (TNM) in the Union for International Cancer Control (UICC), institution types, whether to participate in clinical trials, previous chemotherapy history, duration of treatment events, and hospital referral areas; trends in cancer therapy include personalized therapy, immunotherapy and targeted therapy; the adjustment of new therapies mainly aims to moderately increase the benchmark price based on the proportion of approved drugs adopted in the previous two years. Moreover, the target price is determined by a certain reduction in the benchmark price, such as a 4% reduction (Liao et al., 2020). Finally, CMS evaluates the actual cost of treatment events for medical institutions. If the actual cost is lower than the target price, the medical institution can receive performance rewards. OCM has designed two risk-sharing methods: one is a unilateral mode (balance retention and overspending not to be shared). If the actual cost is lower than the target total, the balance can be retained, yet the maximum balance total does not exceed 20% of the benchmark total (Liao et al., 2020); if the actual cost is higher than the target total, there is no need to share the excessive expenses. And the other is a bilateral model (balance

retention, overspending to be shared), where if the actual cost is lower than the target total, the balance can be retained, yet the maximum balance total does not exceed 20% of the benchmark total; if the actual cost is higher than the target price, then it needs to be overspent and shared, while the maximum shared total does not exceed 20% of the benchmark total (Liao et al., 2020).

The OCM performance reward amount is adjusted in accordance with a series of quality evaluation indicators. The quality evaluation system, with a total of fourteen quality evaluation indicators, covers four dimensions: communication and service coordination, patient and family experience, clinical quality, and patient safety. The performance multipliers of 50%, 75%, and 100% are formed to adjust the performance reward based on the quality evaluation scores (Liao et al., 2020).

2.4.3 Patient-centered oncology payment mode

Patient-Centered Oncology Payment (PCOP) mode is a payment mode of oncology healthcare based on Patient-Centered Medical Homes (PCMHs) proposed by the American Society of Clinical Oncology (ASCO) in 2015 (American Society of Clinical Oncology, 2019). The purpose of PCOP is to reduce the economic burden on cancer patients, while also alleviating the management burden on medical institutions, and focusing on high-quality services in four major areas (including avoiding emergency visits and hospitalization, following evidence-based medical (EBM) plans, patient-centered end-of-life care, and medical quality performance).

The medical service content of the PCOP mode promotes the medical services of cancer patients by providing two paths (Ward et al., 2020), namely basic service requirements and higher service requirements. The basic service requirements, with a total of thirteen specific requirements cover seven dimensions, including patient participation, service accessibility, team-based comprehensive care, quality improvement, patient safety, EBM, and the adoption of CEHRT (Liao et al., 2020); higher service requirements specifically involve four dimensions: patient participation, service accessibility, team-based integrated care, and quality improvement, as well as nine new requirements and twenty-two service requirements (Liao et al., 2020). In the first year of implementation, medical institutions that meet the requirements can choose to enter the path of basic service requirements or the path of higher service requirements; while medical institutions that have already chosen the path of basic service requirements are expected to further enter the path of higher service requirements.

The payment method of PCOP mode consists of three parts: the first is the monthly payment of patient management fees to support medical institutions in carrying out treatment plans, care

management, and active monitoring; the second is pay-for-performance, which is adjusted based upon the quality of medical services, medical expenses, clinical outcomes, and compliance with evidence-based clinical pathways; and the third is the adjusted payment according to project payment. The adjusted payment is merely applicable to the path of higher service requirements. Under the path of basic service requirements, regular services are still paid per project in addition to paying patient management fees to medical institutions. Under the path of higher service requirements, medical institutions can choose to bundle 50% or 100% of project services specifically paid so as to form Consolidated Payments for Oncology Care (CPOC). Among them, 10% of the comprehensive tumor treatment fee will undergo a performance adjustment from 0% to 140%, allowing medical institutions to ultimately receive 90% to 104% of the CPOC (Liao et al., 2020). The services covered by CPOC should at least encompass assessment and management services, parenteral medication and biological agent management services, and comprehensive management services (such as smoking cessation and continuity of care management). Other optional services to be incorporated include surgery, routine laboratory examinations, imaging examinations, radiotherapy services and others. In terms of payment standards, patient management fees and performance payment standards are calculated based on the total medical expenses. The total medical expenses involve physician services, hospitalization, diagnosis, medication, and other medical expenses covered by Medicare.

The performance evaluation system of PCOP mode contains three dimensions: clinical pathway compliance, quality performance, and cost performance. In the dimension of clinical pathway compliance, its rate is calculated based on each clinical practice, and then the total rate is adjusted according to the disease. At last, the total rate will be compared with a performance threshold so as to determine the performance multiplier of the clinical pathway compliance dimension, forming performance multipliers of five levels: 0%, 25%, 50%, 75%, and 100% (Liao et al., 2020). In the dimension of quality performance, several indicators are selected from the Quality Oncology Practice Initiative (QOPI) of ASCO for evaluation, and the scores of each indicator are standardized from 0% to 100%. The average scores of each indicator will be eventually taken to form a quality performance multiplier of 0% to 100% (Liao et al., 2020). In the dimension of cost performance, three indicators are measured: unplanned hospitalization rate, emergency and observation rate, and drug rate for maintenance treatment. All indicators will undergo risk adjustment and be compared with comparable institutions, resulting in a performance multiplier of five levels: 0%, 25%, 50%, 75%, and 100% (Liao et al., 2020). Lastly, the performance multipliers of the three dimensions are weighted and averaged to calculate the

final total performance multiplier (Liao et al., 2020).

2.5 The relationship between physician professionalism and Motivation Theory

A large number of studies on hospital pay-for-performance and physician professionalism have focused on “motivation” and “behavior”. Through a summary of the mechanisms or theories by which hospital pay-for-performance affects the professionalism of physicians, we can find that relevant studies often employ the Motivation Theory to link performance motivations, physician motivation, and behavior. There are two possible reasons: first, the Motivation Theory serves as the theoretical basis for pay-for-performance, expounding the relationship between demand and performance. Generally applied theories include Maslow’s Hierarchy of Needs, Clayton Alderfer’s ERG (Existence, Relation, Growth) theory, Hygiene-motivational factors, Expectancy theory, and Justice Theory (Adams, 1965; Alderfer, 1969; Maslow, 1943); second, in terms of physician professional spirit, clinical physicians’ internal motivation, work attitude, work behavior, emotional reflection on the organization, and the professional spirit that influence themselves are also the major aspects of the application of the Motivation Theory. In the pay-for-performance-related research, psychologists and behavioral economists have conducted extensive empirical and experimental studies in non-medical contexts to confirm the Motivation Theory (Green et al., 2017). In economics, it is recognized as a basic rule that high incentives can lead to high performance. Motivations may affect the motivation of behavior and generate performance results, which is the core theory in behavioral studies that deals with human needs, work motivation, goals, and behavioral relationships, and is also a crucial basis for illustrating how motivations can promote performance (Baker et al., 1988). According to the research focus and content of Motivation Theory, it can be roughly divided into the following three categories:

(1) Theories focusing on studying the specific content of motivation reasons and influencing factors. To begin with, the theory proposed to adopt the concept of people’s “need” as a motivational factor: as Čulibrk et al (2018) said, based on the Hawthorne experiment for studying work motivation, Maslow (1943) proposed the well-known Hierarchy of Needs Theory, attempting to reveal the needs and motivations of human behavior. Maslow’s Hierarchy of Needs Theory interprets human behavior as a need for five levels; subsequently, American psychologist (Alderfer, 1969) proposed the Existence Relativity Growth (ERG) Theory, which categorizes human needs as existence needs, relatedness needs, and growth needs; David

McClell put forward the Three Needs Theory, which holds that the three most pivotal needs are Need for Achievement (seeking the driving force of superiority), Need for Power (making others conform to his/her will and desires), and Need for Affiliation (seeking to establish close relations with others) (Tottrup et al., 2009). Moreover, a representative exploration of motivational factors is Herzberg's Motivation-hygiene theory (Herzberg, 1959), which divides factors that affect performance into two categories: hygiene factors and incentive factors. Hygiene factors are necessary and insufficient ones for employees to feel satisfied and generate performance. Lack of them may engender dissatisfaction, while possessing them may not motivate them; incentive factors are sufficient and unnecessary factors that can make employees feel satisfied, such as recognition and a sense of achievability.

(2) Theories focusing on studying the theories of psychological processes from motivation generation to behavior. A representative example is the Expectancy Theory proposed by American psychologist Vroom (1964), which believes that motivation is equal to the product of expectancy and valence (The formula is expressed as $M = \sum V \times E$). Expectancy is an employee's expectation of the likelihood of achieving performance goals, and valence is a judgment of their own value. Another theory is the American psychologist Adams' Social Justice Theory (Adams, 1965). As explained above, it reveals the relationship between motivation and cognition. A person compares the remuneration received with other people and with his own historical level, and when the comparison turns out unfair, job performance may be affected.

(3) Theories focusing on the theories of how to motivate and improve human behavior to achieve goals. The earliest "motivation response" theory applied motivation methods to encourage employees' corresponding fixed behaviors (Huang & Fu, 2013). Similar results include Skinner's (1963) "Reinforcement Theory", which suggests that behavioral outcomes can regulate behavior, with rewards increasing behavior frequency and punishments decreasing behavior. This was first supported by animal research, and later demonstrated in human studies that there is a direct relationship between motivation and behavior growth (Toppen, 1965). Adams' Frustration Theory (Adams, 1965) states that if an employee's goals cannot be achieved and their motivation and needs cannot be met, they will experience frustration, resulting in positive or negative behavior; Austrian psychologist Heider (1944) proposed the Attribution Theory, which explains the logical relationship between human behavior and factors such as motivation and purpose. It is believed that the self-awareness of an individual's behavior is generally attributed to two types: external factors such as social opinion and work environment are called situational attribution, and internal ones such as competence and interest are called

personality tendency attribution.

2.6 relationship between pay-for-performance schemes and physician professionalism

As pay-for-performance mechanisms are increasingly adopted in healthcare systems around the world, researchers from various countries have also conducted extensive research on pay-for-performance. These studies chiefly concentrate on the impact of different pay-for-performance policies or plans on healthcare quality, yet there is an inadequacy of conclusive evidence to prove that performance is helpful in improving healthcare quality (Fung et al., 2008). Scholars continue to call for future performance to be based on physician professionalism (Roman & Major, 2022), but the impact of pay-for-performance on physician professionalism is controversial. In theory, the main goal of most performance-based payment plans is to improve medical quality, linking financial incentives with medical quality and pay-for-performance indicators and aligning performance with the incentives of physician professionalism for medical quality, thereby promoting physician professionalism (DeCamp & Snyder Sulmasy, 2021). However, since the introduction of pay-for-performance in the healthcare system, there has been intense debate on the impact on physician professionalism, which primarily centers on the following two aspects:

(1) The theoretical basis for pay-for-performance and physician professionalism is not entirely consistent. For example, a study in 2007 found that pay-for-performance is detrimental to the Hippocratic Oath because it directly conflicts with traditional beliefs such as altruism that provide strong motivation for doctors (Auer et al., 2021). However, in 2017, a scholar applied the KMRW (Kreps, Milgrom, Roberts and Wilson) reputation model to study the impact of pay-for-performance on doctor altruism, pointing out that incorporating altruism promotion and information dissemination into pay-for-performance plans can make underperforming doctors work harder. When emphasizing the role of altruism in physicians' professional spirit, people often believe that behavior based on self-interest does not stay in line with physicians' professional spirit (Hemenway et al., 1990). But at the end of 2017, the eighth revision of the Hippocratic Oath called on doctors to "value their own health, livelihood, and capabilities so as to provide the highest level of medical care" (Parsa-Parsi, 2017). This seemed to strengthen doctors' concern for their own interests, which is morally permissible. In 2006, some scholars proposed that performance-based payment undermined doctors' intrinsic motivation, causing them to sacrifice their professional spirit for compensation (Roland, 2006). In 2010, after

evaluated by an expert advisory committee, the American College of Physicians (ACP) believed the theoretical conflict between pay-for-performance and physician professionalism was not inevitable, and that the development of physician professionalism could be encouraged through reasonable actions (Khan et al., 2020).

(2) Measures for pay-for-performance are often inconsistent with measures for strengthening clinical physician professionalism in terms of improving medical quality. For instance, researchers pointed out in 2015 that compared to pay-for-performance systems, clinical physicians value professional autonomy over micro-management, emphasize patient relationships over mandatory doctor-patient interactions, and attach more importance to internal motivators based on social theory rather than external ones based on economic theory (Gadsden et al., 2021). However, a 2017 financial incentive report on hypertension management in the United States (Hysong et al., 2017) disclosed that the pay-for-performance can have positive unintended consequences, such as promoting the revision of medical guidelines or documents by medical groups, which is clearly a pathway for promoting medical quality through physician professionalism. In 2018, a study also stressed that improving the pay-for-performance system can fully stimulate most doctors' motivation (Khullar et al., 2018; McClellan & Thoumi, 2015).

In general, the discussion of hospital pay-for-performance and physician professionalism by most researchers has two characteristics: the first characteristic is commonly to discuss one aspect of physician professionalism. However, physician professionalism is essentially a complex set of concepts, and it may even change with different cultures. Therefore, it is incomplete to solely attribute physician professionalism to factors such as altruism or duty ethics, and it is not comprehensive to assert the overall impact of pay-for-performance on a certain aspect of physician professionalism from a single perspective. Instead, we shall discuss the impact on each element of physician professionalism more comprehensively (Wilkinson et al., 2009). The second characteristic is usually based on the theoretical assumption that pay-for-performance generates incentives, which is the "economic man" hypothesis. In this hypothesis, doctors are always guided by maximizing their own utility, seemingly contradictory to altruism and egoism. This viewpoint is evident and rarely questioned, but many current researches are debating on it. The performance mechanism regulates doctors' behavior and this implies a hypothesis that financial incentives increase the motivation for behavior. Therefore, the impact of pay-for-performance on physician professionalism may not only derive from financial incentives, but also from its impact on doctors' intrinsic work motivation, which is the driving force behind various changes (Herzer & Pronovost, 2015). There are also studies indicating that intrinsic work motivation is related to social responsibility, trust, teamwork, and ethics (Khalaf

et al., 2022). Obviously, these aspects are closely related to physician professionalism, and the financial incentives under pay-for-performance are consistent with the incentives of physician professionalism for medical quality. In practice, the impact of pay-for-performance on physician professionalism is more complex when physicians' intrinsic motivation is taken into account.

Chapter 3: Qualitative Study on the Relationship between Pay for Performance and Physician Professionalism

3.1 Research method

This thesis comprises three studies. Study 1 employs qualitative interviews to explore the relationship between Pay-for-Performance Satisfaction and physician professionalism. Building on the findings of Study 1, Study 2 involves the development of a questionnaire aimed at quantifying physician professionalism. Study 3 utilizes the questionnaire developed in Study 2 to conduct an empirical investigation into the relationship between PFPS and physician professionalism.

In China, research on physician professionalism is still in its early stage. This study takes expert physicians from the Sanming First Hospital and the Sanming Integrated Medicine Hospital in Fujian Province as research objects. Based on expert interviews, this study explores the relationship between physician professionalism and PFPS, seeking empirical evidence to improve the quality of medical care (Im et al., 2023; Pyo et al., 2023). As the information held by experts is isolated and cannot form a unified and integrated information set, we chose to use the qualitative research method of expert interviews. Currently, in China, there is a lack of a standardized and systematic integrated network framework for collecting expert viewpoints and researchers lack sufficient quantitative data and structural standards when collecting data and conducting quantitative research validation in the research on the relationship. This provides a possibility to construct a mechanism of the relationship between physician professionalism and PFPS. Expert interviews are particularly suitable for studying phenomena in their initial stage. Although quantitative datasets are allowed to be used in expert interviews, open-ended or closed-ended interviews are primarily a flexible non-quantitative method. This method can gradually collect expert experiential data and establish a standardized theoretical framework for the relationship between physician professionalism and PFPS in China. Moreover, expert interviews help identify blind spots and eliminate extreme opinions, leading to consensus opinions and new conceptual categories. In conclusion, compared to quantitative research, the qualitative research method of expert interview is more effective in revealing the internal interactive relationship and network between physician professionalism and pay for

performance. Specifically, this study adopts the method of expert interviews, which follows the Grounded Theory (GT) method (Edgington & Eugene, 1967), and combines the data analysis method of open coding and axial coding by Gioia et al. (Im et al., 2023; Pyo et al., 2023). This approach helps researchers discover new empirical evidence by comparing the viewpoints of different interviewees.

3.2 Data collection

The qualitative data for empirical analysis in this study was collected through expert interviews.

3.2.1 Interviews

This study employed the method of expert interviews. Over the years, this method has been widely promoted and applied in fields such as healthcare, educational surveys, and psychological counseling. Since research on the relationship between physician professionalism and pay for performance in China is still in its early stage, the study tries to gaining a deeper and more detailed understanding from the knowledge and experience of the research objects. Therefore, it is not necessary to select many experts as research objects. When information repetition or saturation occurs, “theoretical saturation” is reached, and the interviews or observations should be stopped (Jin, 2019).

3.2.1.1 Sample institutions

In this study, high-quality institutions that highly value physician professionalism and their expert physicians were selected as samples. The specific selection process included two steps. Firstly, a target city was determined. The field research was conducted in Sanming City, Fujian Province, where two Grade A tertiary hospitals were selected as the research objects: Sanming First Hospital and the Sanming Integrated Medicine Hospital. There were two reasons for choosing this city. The first reason is that Sanming City, Fujian Province, is considered a star city for healthcare reform in China, with the well-known “Sanming Medical Reform” serving as a model for healthcare reform nationally. This indicates that Sanming has rich practical experience in medical reform. Additionally, Sanming is relatively economically and culturally developed, has abundant medical resources and enjoys mature operation of Grade A tertiary hospitals. Therefore, it is reasonable to choose Sanming as the target city to study the impact of physician professionalism on pay for performance. Secondly, the author works in a large pharmaceutical manufacturing company in Sanming and most of the available resources are in

this city as well. Conducting face-to-face research in other cities would have certain limitations, making it difficult to obtain effective empirical data. Therefore, selecting two Grade A tertiary hospitals in Sanming as the research objects is reasonable. Although only the two hospitals were surveyed, with the support of various resources, the study obtained rich empirical data sufficient to present relatively objective research results.

The research was conducted in two stages. In the first stage, the survey took place from November 10, 2023, to November 25, 2023. 12 experts were selected to conduct face-to-face interview. They are from fields such as clinical medicine, preventive medicine, public health, and health management. These interviewees were employed at Sanming First Hospital and the Sanming Integrated Medicine Hospital, which are the most renowned high-quality medical institutions in Sanming city, Fujian Province. In the second stage, the survey took place from November 25, 2023, to January 5, 2024. The researcher revisited the two hospitals, where interviews with a total of 13 expert physicians were conducted.

3.2.1.2 Interviewees

After determining the sample institutions, 25 experts were selected for this interview. These experts should: (1) hold senior professional titles in relevant fields with a working experience of more than 15 years, or hold a relevant doctoral degree if they do not have senior professional titles; (2) or hold a doctoral degree in relevant specialties, or hold an associate senior professional title or higher if they do not have doctoral degrees; and be familiar with physician professionalism and hospital management; (3) have worked in the same hospital for more than 5 years; (4) be willing to engage in unrestricted discussions before formal selection. At the same time, the researchers promised to keep the content of the expert interviews confidential and anonymized during the research process. The study compiled relevant theories and materials on physician professionalism and sent them to interviewees for in-depth understanding, so that they can better answer questions.

This study adopted a semi-structured interview of face-to-face format, which allowed for a series of open-ended questions to be discussed on a relatively flexible structural basis. This kind of interview allows interviewees to be guided into deeper areas as the conversation progresses within structured dialogues. Moreover, researchers can use a series of follow-up questions for interactive discussions to gather more comprehensive information. The interview outline consisted of two parts: the basic information about the interviewees and the interview outline which was formed based on the selection criteria of the experts and the influence of physician professionalism on pay for performance. The researchers sent the initial interview outline to

two experts in this field with doctoral degrees or senior professional titles to revise the content and obtained the following 11 open-ended interview topics (see Table 3.1). During the interview, the interviewees can select one or more topics to engage in in-depth discussions. When interviewees had different opinions on a particular topic, discussions could be conducted based on their age and gender, aside from their stakeholder status.

Table 3.1 The Interview outline

The information of interviewees			
Work unit	Highest degree	Title	Years in profession
Field of specialization		Position	
Topic number	Interview topics		
	Topic content		
1	Under the framework of pay for performance and physician professionalism, please share your opinions about the impact of commitment to improving quality of care on pay for performance.		
2	Under the framework of pay for performance and physician professionalism, please share your opinions about the impact of commitment to professional competence on pay for performance.		
3	Under the framework of pay for performance and physician professionalism, please share your opinions about the impact of commitment to being honest with patients on pay for performance.		
4	Under the framework of pay for performance and physician professionalism, please share your opinions about the impact of commitment to keeping patients' confidentiality on pay for performance.		
5	Under the framework of pay for performance and physician professionalism, please share your opinions about the impact of commitment to improving access to care on pay for performance.		
6	Under the framework of pay for performance and physician professionalism, please share your opinions about the impact of commitment to fairly distributing limited medical resources on pay for performance.		
7	Under the framework of pay for performance and physician professionalism, please share your opinions about the impact of commitment to acquiring scientific knowledge on pay for performance.		
8	Under the framework of pay for performance and physician professionalism, please share your opinions about the impact of commitment to being responsible for the profession on pay		

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

The information of interviewees	
	for performance.
9	Under the framework of pay for performance and physician professionalism, please share your opinions about the impact of commitment to putting the interests of patients first on pay for performance.
10	Under the framework of pay for performance and physician professionalism, please share your opinions about the impact of commitment to maintaining trust by solving conflicts of interest on pay for performance.
11	Under the framework of pay for performance and physician professionalism, please share your opinions about the impact of pay for performance on therapeutic outcome.

This research used a semi-structured interview method. The outline was designed based on the impact of the ten dimensions of physician professionalism (commitment to improving quality of care, improving professional competence, being honest with patients, keeping patients' confidentiality, improving access to care, fairly distributing of medical resources, acquiring scientific knowledge, being responsible for the profession, putting the interests of patients first, and maintaining trust by solving conflicts of interest) on pay for performance (Project, 2002). During the interview, interviewees are required to provide their profound insights on open-ended questions. A total of 25 interviews were conducted in this study, with the shortest interview lasting 26 minutes, the longest lasting 151 minutes, and an average duration of 74 minutes. Responses of interviews, including important interview information, tone, expressions, and behavioral cues, were all recorded on-site. With the consent of the interviewees, the entire process was recorded, and the audio files were transcribed the day after the interview on a professional transcription device. And the transcribed materials were returned to the interviewees for confirmation.

Among the 25 experts interviewed, there were 3 attending physicians, 7 associate chief physicians, 13 chief physicians, and 2 master's supervisors. All the selected experts were from the Sanming First Hospital and the Sanming Integrated Medicine Hospital in Fujian Province. Please refer to Table 3.2 for more detailed information.

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Table 3.2 Statistics of expert interview information

Item		Number of people	Proportion (%)
Workplace	Sanming First Hospital	12	48%
	Sanming Integrated Medicine Hospital	13	52%
Professional field	Clinical medicine	13	52%
	Preventive medicine	5	20%
	Public health	4	16%
	Healthcare management	3	12%
Years of working	25 years or more	11	44%
	15-25 years	14	56%
Professional title	Intermediate professional title	3	12%
	Associate professional title	7	28%
	Senior professional title	13	52%
	Master's supervisor	2	8%
Highest academic degree	Doctoral degree	15	60%
	Master's degree	8	32%
	Bachelor's degree	2	8%

3.3 Data analysis process

This study employed the method of open coding and axial coding for data analysis in the study of Gioia et al. (2013). Firstly, the interview data was conceptualized to clarify the analysis context and process. The interview results were then subjected to keyword extraction and categorized materials with the same meaning into the same category. Secondly, the interview data that met the extraction categories were coded, and the conceptualized data were continuously categorized, incorporating into the categories' attributes and dimensions. Thirdly, connections were established between different categories, and theoretical coding was ultimately formed. The data processing in this study consisted of three stages, as presents in Figure 3.1.

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

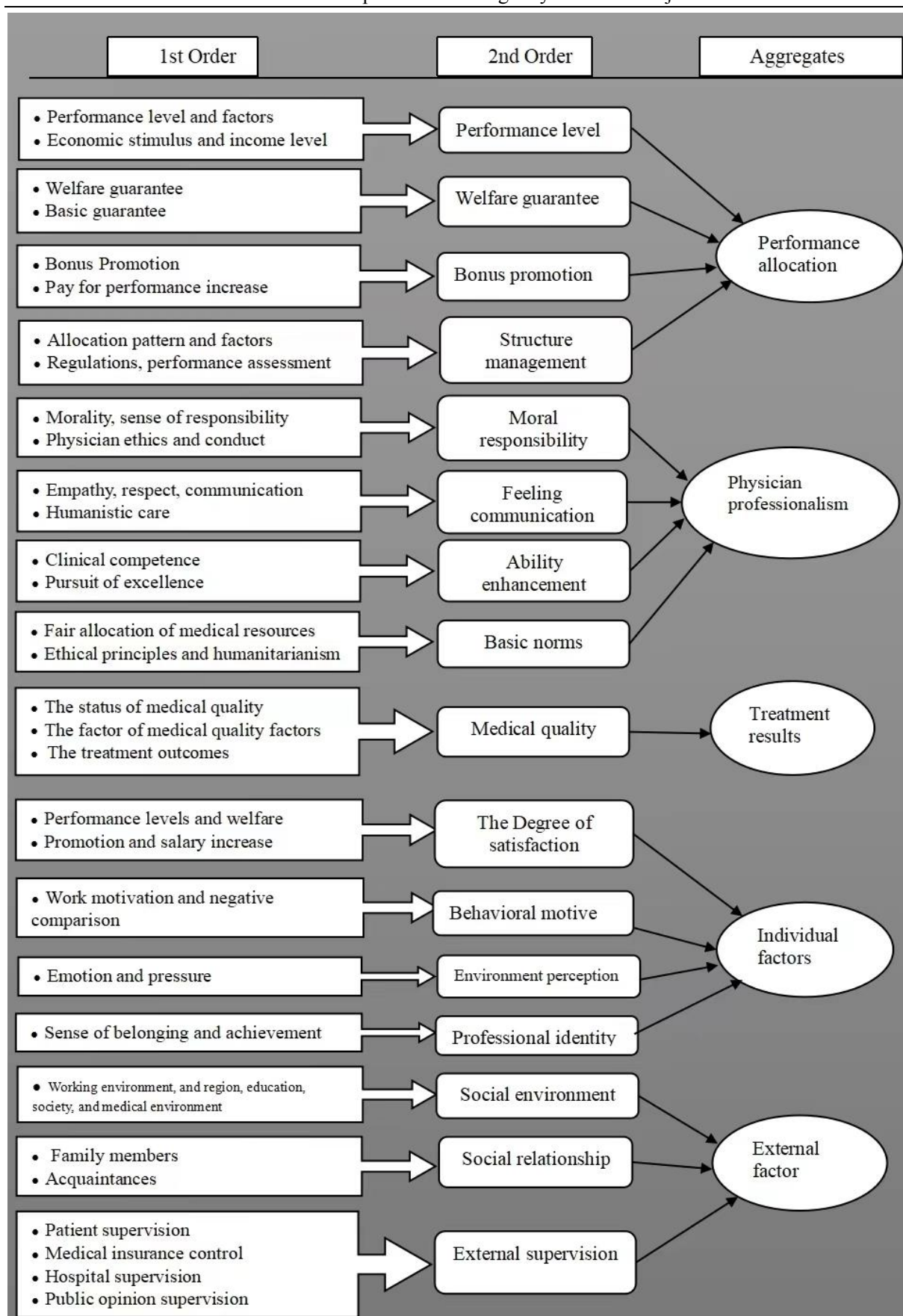


Figure 3.1 Structured data

The first stage was the initial coding stage. The viewpoints expressed by the 25 interviewees on the selected questions were transcribed sentence by sentence and coded. This process yielded 62 initial codes, which represented the interpreted conceptions of the interview data (refer to Figure 3.1 and Table 3.3).

Table 3.3 Structured data

The summary of excerpted key words from interviews	Initial coding	Focused coding	Axial coding/ Theoretical coding
(1) Performance (2) Performance level (3) Performance factors (4) Performance impact (5) Income impact (6) Economic stimulus (7) Material incentives (8) Material rewards (9) Income comparison (10) Income expenditure level (11) Income impact	(1) Performance level (2) Performance factors (3) Economic stimulus (4) Income expenditure level	Performance level	Performance allocation
(1) Welfare guarantee (2) Guarantee (3) Economic guarantee (4) Off-duty guarantee (5) Basic guarantee	(1) Welfare guarantee (2) Basic guarantee	Welfare guarantee	
(1) Bonus assessment (2) Bonus Promotion (3) Pay for performance increase	(1) Bonus Promotion (2) Pay for performance increase	Bonus promotion	
(1) Workload risk factor allocation (2) Workload level allocation (3) Performance impact (4) Allocation pattern (5) Allocation factors (6) Performance assessment (7) Equal distribution (8) Regulations (9) Accountability system (10) Star department award	(1) Allocation pattern (2) Allocation factors (3) Regulations (4) Performance assessment (5) Reward and punishment system (6) Accountability system	Structure management	

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

The summary of excerpted key words from interviews	Initial coding	Focused coding	Axial coding/ Theoretical coding
(11) Therapeutic effect allocation (12) Reward and punishment system (13) Awareness of the system; (14) Accountability system (14) Assessment of physician ethics and conduct (15) Indicators of physician professionalism (16) Reward pattern			
(1) Moral responsibility (2) Kindness (3) Role model (4) Morality (5) Physician ethics and conduct (6) Feelings of responsibility (7) Doctor's responsibility (8) Sense of responsibility (9) Honesty and integrity (10) Integrity and honesty	(1) Morality (2) Sense of responsibility (3) Integrity and honesty (4) Physician ethics and conduct	Moral responsibility	Physician professionalism
(1) Communication, empathy, respect (2) Cooperation and communication (3) Humanistic care (4) Conflicts communicating (5) Doctor-patient communication (6) Service attitude (7) Respect (8) Communication (9) Sympathy	(1) Communication (2) Empathy (3) Respect (4) Communication and Cooperation (5) Humanistic care (6) Doctor-patient communication	Feeling communication	
(1) Clinical competence (2) Self-improvement (3) Teaching (4) Research teaching (5) Research	(1) Clinical competence (2) Pursuit of excellence	Ability enhancement	

The summary of excerpted key words from interviews	Initial coding	Focused coding	Axial coding/ Theoretical coding
(6) Pursuit of excellence (7) Post competence			
(1) Professional responsibility (2) Fair allocation of medical resources (3) Ethical principles (4) Humanitarianism (5) Basic qualities (6) Doctor's duties (7) Diagnosis and treatment standards	(1) Fair allocation of medical resources (2) Ethical principles (3) Humanitarianism (4) Profession duty	Basic norms	
(1) Comparison of performance levels (2) Low pay for performance (3) Dissatisfaction with low salary (4) Satisfaction with salary (5) Satisfaction with star department (6) Basic salary (7) Salary raise deductions (8) Satisfaction with structural management (9) Promotion and salary increase (10) Satisfaction with income comparison (11) Welfare guarantee (12) Satisfaction with allocation factors (13) Dissatisfaction with workload (14) Lack of incentive measures (15) Satisfaction with rewards	(1) Performance levels (2) Welfare guarantee (3) Promotion and salary increase (4) Satisfaction with structure management	The Degree of satisfaction	Individual factors
(1) Game theory (2) Work motivation (3) Initiative (4) Resignation (5) Negativity (6) Negative comparison (7) Rent-seeking; (8) Resignation	(1) Game theory (2) Work motivation (3) Initiative (4) Resignation (5) Negativity (6) Negative comparison (7) Rent-seeking (8) Resignation.	Behavioral motive	

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

The summary of excerpted key words from interviews	Initial coding	Focused coding	Axial coding/ Theoretical coding
(1) Emotional harm (2) Comparative pressure (3) Work pressure (4) Communication pressure (5) Perceived pressure	Emotion pressure	Environment perception	
(1) Sense of belonging (2) Sense of achievement (3) Sense of fulfillment (4) Value (5) Recognition (6) Sense of identity (7) Social identity (8) Professional identity (9) Occupational recognition (10) Self-identity (11) Self-demands (12) Sense of honor (13) Occupational awareness (14) Superiority (15) Social status	(1) Sense of belonging (2) Sense of achievement (3) Value (4) Sense of identity (5) Sense of honor (6) Social status	Professional identity	
(1) Specificity of the working environment (2) Region (3) Environmental requirements (4) School education (5) Social cognition (6) Medical environment (7) Medical disputes (8) Hospital environment (9) Professional environment	(1) working environment (2) Region (3) Education (4) Society (5) Medical environment	Social environment	External factor
(1) Peers (2) Family members (3) Acquaintances (4) Industry peers (5) Colleagues (6) Acquaintances (7) Classmates	(1) Family members (2) Acquaintances (3) Others	Social relationship	
(1) Patient satisfaction (2) Patient complaints	(1) Patient supervision (2) Medical insurance control	External supervision	

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

The summary of excerpted key words from interviews	Initial coding	Focused coding	Axial coding/ Theoretical coding
(3) Medical insurance control (4) Performance mechanism (5) Supervision by leaders (6) Public discourse (7) Hospital supervision (8) Media supervision (9) Social expectations (10) Public opinion supervision.	(3) Hospital supervision (4) Public opinion supervision		

The second stage was the focused coding stage. The most acute and comprehensive initial codes from the interview were constructed into categories pointing towards deep theoretical attributes, making these categories highly directive, selective and conceptual. Based on the level of importance and the concepts reflected, the initial codes were refined as a whole, resulting in 16 focused codes.

The third stage was the axial coding or theoretical coding stage. In this stage, the relationships between categories formed in the second stage of focused coding were refined and categorized, grouping together focused codes with similar attributes into an axial or theoretical code. Furthermore, focused codes containing multiple attributes were traced back to the initial coded data and broken down to be classified into different focused codes, establishing a dense network of relationships centered around core codes or theories. In this stage, a total of five axial codes reflecting the research objects were formed.

Based on the aforementioned processing process, in the open coding of this study, 14 first-order codes related to pay for performance were generated. Through continuous comparison of these first-order codes, they were integrated into four second-order codes: performance level, welfare guarantees, promotion and pay raise, and structural management. These four codes were further integrated into a comprehensive dimension of pay for performance. Similarly, 16 first-order codes related to physician professionalism were integrated into four second-order codes: moral responsibility, communication and emotions, competence improvement, and basic norms. These second-order codes were further integrated into a comprehensive dimension of physician professionalism. Data associated with medical results produced 3 first-order codes, the status and elements, which were integrated into one second-order code: medical results, further combined into the comprehensive dimension of medical quality. Data on individual

factors resulted in 16 first-order codes integrated into 5 second-order codes: satisfaction, behavioral motivation, environmental perception, and identity recognition, further consolidated into the comprehensive dimension of individual factors. Finally, data on the external environment generated 12 first-order codes integrated into 3 second-order codes: social environment, social relations, and external supervision, further merged into the comprehensive dimension of the external factors.

When sorting out the analysis materials, emphasis was placed on the parallel collection and analysis of data-- ensuring audio data was transcribed into written texts immediately after the interviews, aligning every word and sentence to guarantee correspondence between audio and text. Additionally, the personal information of interviewees was anonymized (e.g., using “SMY” to represent a certain expert). Coding in NVivo12.0 involved collaborative coding by two proficient researchers to ensure linguistic reliability. In case of discrepancies or uncertainties between the two coders, a third researcher would join for a consensus discussion on coding decisions, employing a majority-rule principle to ensure good coding reliability.

To further explore the relationship between various dimensions of pay-for-performance satisfaction and different dimensions of physician professionalism, this study conducted a cross-analysis of the four dimensions of satisfaction interview data of physician pay for performance: overall level, pay raise, pay management, welfare; and the four dimensions of physician professionalism: moral responsibility, communication and emotions, competence improvement, and basic norms. Additionally, the analysis also included the various dimensions of individual factors, external factors, and medical quality for cross-analysis to statistically validate the impact of pay for performance in the public Grade A tertiary hospitals of Sanming City, Fujian Province on clinical physician professionalism based on the reference points of initial coding.

3.4 Discussion

3.4.1 Relationship between pay-for-performance satisfaction and physician professionalism

After extracting and summarizing key words from interview materials, as well as analyzing the theoretical relationship generated by initial coding and focused coding and axial coding of the interview materials, we found that in the qualitative research, pay for performance affects pay-for-performance satisfaction, thereby affecting the behavioral cognition of clinical physicians.

Pay-for-performance satisfaction and the behavioral cognition of clinical physicians affect or play a part in physician professionalism. Without doubt, external factors also have an impact on physician professionalism, pay-for-performance satisfaction and the behavioral cognition of clinical physicians. Pay for performance has a certain impact on the clinical decision-making and medical behavior of physicians, leading to different medical outcomes. These outcomes, in turn, affect the formulation and implementation of pay-for-performance policies in hospitals. The specific impact paths include the following seven aspects:

Pay for performance affects the satisfaction or dissatisfaction of clinical physicians with their own pay for performance. To be specific, the four dimensions of pay for performance, namely, performance level, welfare guarantee, promotion and pay increase, and structural management all have an impact on the pay-for-performance satisfaction of clinical physicians. Among them, performance level and structural management exert the most substantial influence.

The satisfaction level of clinical physicians with pay-for-performance and its sub factors affects their professionalism. These sub factors include satisfaction with performance level, welfare guarantee, promotion and pay increase, and structural management.

The pay-for-performance satisfaction affects the behavior and cognition of clinical physicians, including their sense of honor, belonging, and professional identity, which leads to behaviors such as resignation, motivation, gaming, and rent-seeking.

The identity recognition and environmental perception of clinical physicians affect professionalism.

The pay-for-performance satisfaction, behavioral cognition, and physician professionalism of clinical physicians have an impact on the quality of medical services or medical outcomes.

(6) The quality of medical services or medical outcomes prompt hospitals to adjust their pay-for-performance policies and management.

(7) The social environment, social relationships, and external supervision of clinical physicians in hospitals affect pay-for-performance policies, medical quality, behavioral cognition, pay-for-performance satisfaction, and physician professionalism.

In summary, pay-for-performance satisfaction reflects the individual satisfaction or dissatisfaction of clinical physicians with pay for performance, and it is also an important internal factor affecting physician professionalism.

3.4.2 Influencing factors of pay for performance on the physician professionalism

Although implementing a pay-for-performance system in hospitals may increase the compliance of clinical physicians with clinical guidelines, thereby improving medical quality (Middleton, 2018; Minchin et al., 2018), there is a lack of sufficient theoretical basis for the impact of pay for performance on clinical professionalism. Moreover, existing research in this area is not only limited but also contentious. For example, some researchers believe that pay for performance can improve the professionalism of clinical physicians by fostering their positive attitudes towards patients, nurturing their teamwork ethos, and fostering their empathy towards patients (Pronovost et al., 2015; Waterfield & Barnason, 2022). However, other researchers have raised concerns that the introduction of such a system may compromise the humanitarianism of clinical physicians, undermine their intrinsic motivation, and may violate medical ethics, thereby jeopardizing physician professionalism (Wynia, 2009; Zweifel & Janus, 2017b). The relationship between pay for performance and physician professionalism, as examined in this study, shows that the four dimensions of pay for performance (performance level, welfare guarantee, promotion and pay increase, and structural management) have varying impacts on physician professionalism and its various dimensions (moral responsibility, communication emotion, ability enhancement, and basic norms). The implementation of a pay-for-performance system may bring clinical physicians some incentives which may improve clinical professionalism. However, the good results brought by the incentives may be offset by other unexpected events.

Firstly, the moral responsibility in physician professionalism has a more significant impact on the performance level and structural management in pay-for-performance satisfaction. SMZ7 expert said, “The amount of money that I get does not affect my attitude towards patients. I believe this is the bottom line of being a doctor. Although I have a certain demand for economic rewards as a social being, I am a doctor. Pursuing economic rewards is not the whole part of my job. I believe that performance has a negative impact on medical ethics and practices. Implementing an annual salary system is more conducive to treating patients’ conditions in an objective way.” This indicates that pay for performance has a negative impact on medical ethics and practices. Besides, in terms of structural management, SMW2 expert said, “Our hospital conducts appraisal activities among departments every year. Professional and social ethics are a part of the appraisal. I think this kind of appraisal is very valuable and meaningful. It not only promotes teamwork, but also serves as a warning for departments with poor evaluation.” This indicates that a well-recognized pay-for-performance structure or management model has a

positive impact on the moral responsibility of doctors.

Secondly, performance level and structural management have a significant impact on the empathy, respect, communication, and cooperation within the dimension of “communication emotion” of physician professionalism. SMM4 expert pointed out, “too few rewards may fail to motivate physicians to engage in more emotional communication with patients. Conversely, an excess of rewards may lead physicians to engage in superficial or insincere communication with patients.” This indicates that too many rewards will damage doctor-patient communication effect and too few rewards will not boost emotional communication between physicians and patients.

Thirdly, the various dimensions of pay for performance have a more complex and diverse impact on “clinical ability enhancement” in physician professionalism. SMW6 expert said, “We are already very busy with work, but we still take time to learn. For example, we have to spend an hour on group training every morning. Although this may seem like a formality and increase our workload, it is not much tiring compared to the health of patients. Money cannot drive us to make these efforts.” As the expert points out, although pay for performance is not high, physicians are still striving to improve their clinical abilities because they have noble clinical professionalism which is patient-centered in their hearts, and the pay-for-performance system in hospitals does not promote this spirit. Some experts believe that although material incentives are not entirely related to the pursuit of excellence, they may still play a part. SMY7 expert believes, “the pursuit of excellence and the cultivation of humanistic qualities may not be closely related to material incentives, but material incentives have an impact on the self-improvement of physicians. As the Chinese saying goes, ‘A skilled woman cannot cook without rice’ and ‘Food and fodder should go before troops and horses’, it is unrealistic to pursue further studies without certain material incentives.” The opposite view is that pay for performance has a negative impact on “ability enhancement”. Respondent SMY8 stated, “A doctor introduced by our department is always busy applying for various funding projects during the annual funding project application season, and even frequently stays up all night. After submitting papers, he often stays up all night to revise them. Although his performance score is very good, his frequent staying up all night for performance seriously damages his physical health. So, pay for performance has a negative impact.” Welfare guarantee plays a role in ensuring and supporting the clinical ability enhancement of physicians to a certain extent. For example, most doctors in hospitals can apply to pursue a higher degree while off work, and they can enjoy basic salary and other welfare guarantee at the same time, which effectively enhances the abilities of clinical physicians. SMY11 expert said, “I was an off-job master and doctoral

student with basic salary. If there was no such a policy at that time, I would not have resigned to pursue a higher degree because I had a family and had to earn a living. If I did not have welfare guarantee and had to pay by myself to pursue a higher degree, it would have been absolutely unrealistic because the pressure would have been very great.”

Fourthly, pay for performance in hospitals has no impact on the fair allocation of medical resources and the “basic norms” of humanitarian and ethical dimensions in physician professionalism. SMY12 expert said, “Since we have chosen to be a physician, we must abide by the most basic professional ethics. Adhering to these basic norms is the most basic quality of a physician. If a physician does not possess this basic quality, he/she will not be worthy of becoming an angel in white. Performance has no impact on basic norms.” Another reason is that basic norms such as humanitarianism and ethical rules are difficult to quantify. They can only be assessed by taking a qualitative method according to certain standards. SMY14 expert pointed out, “a negative list of qualitative assessment, such as receiving bribery and gifts from patients and their families, helps to specify certain behavioral norms, which guarantees the interests of patients to a certain extent” (Wang & Min, 2019).

3.5 Problems and improvement strategy

3.5.1 Current situation of hospital pay-for-performance that affects physician professionalism

According to the interviews with 25 experts based on the 11 open-ended questions, and by classifying and coding the interview results, the following consensus was reached.

3.5.1.1 Single hospital performance evaluation indicators

There is no good solution to the essential contradiction between the public welfare mission of Chinese hospitals and the self-financing of hospitals. Although the reform of public hospitals in China is continuously advancing, these reforms have not resolved the contradiction. That is to say, Chinese public hospitals should not only embody the public welfare, but also be self-financing and pay attention to cost accounting. This requires physicians to focus on both valuable curative effects and hospital performance, which is a contradiction in itself. It provides value to patients (where value is the quotient of efficacy and cost, i.e., better efficacy and lower diagnostic and treatment costs). At the same time, this makes China’s public hospitals directly link the salary distribution with the performance assessment of physicians and the completion of economic indicators. This assessment and distribution method not only increases the profit-

seeking behavior in the medical process, but also fails to reflect the work intensity, technical factors and labor risks of medical staff. This will undoubtedly lead to the deep-rooted contradiction between the profit-seeking behavior of physicians in the diagnosis and treatment process and the value-based medical behavior based on the requirement of professional ethics, and even distort physician professionalism, which is not conducive to the cultivation and development of physician professionalism. As a result, the service concept of “patient first” can only remain a slogan and cannot be specifically implemented, resulting in a gradual lack of humanistic care in the diagnosis and treatment process, leading to a tense doctor-patient relationship. This is similar to the research findings of other scholars, that is, the doctor-patient relationship is prone to evolve into a simple sale contract relationship.

3.5.1.2 Insufficient incentive effect of pay-for-performance for physicians in hospitals

The hospital's pay-for-performance is the salary paid to physicians according to corresponding standards based on the hospital's performance evaluation results. The practice in Chinese public hospitals is that 60% of pay-for-performance will be paid monthly along with the physician's basic salary, and 40% of it will be used as incentive pay to adjust the income gap among physicians. In addition, the pay-for-performance of physicians in public hospitals in China is also affected by their professional titles, positions, educational backgrounds, and years of service. This narrows the promotion channels of pay-for-performance for physicians, resulting in the insignificant incentive effect of pay-for-performance on physicians' salaries. In other words, the actual contribution value of physicians based on human capital is often ignored, resulting in a mismatch between the actual contribution value of physicians and the pay-for-performance they receive. At the same time, this narrow pay-for-performance incentive measure cannot reflect the degree of hard work of physicians in core positions and positions with medical risk. This classification and extraction result is similar to that of the research of other scholars (Wang & Hou, 2015). A qualified physician needs to go through a long training cycle and bear enormous work pressure on the job, with not only requires high education and skills, but also high-intensity work. If they cannot obtain a matching high income, they are prone to unfair feelings and job burnout, which can affect their work attitude and behavior, and destroy physician professionalism.

3.5.1.3 The pay-for-performance system in public hospitals is not perfect enough

The interview results show that there is considerable dissatisfaction among physicians in public hospitals with regard to the number and the composition of hospital welfare benefits. The fundamental reason is that the payment and management of pay-for-performance in public

hospitals is mainly in the form of currency. Combined with Herzberg's motivation-hygiene factors, it has been found that although monetary pay-for-performance can eliminate physicians' dissatisfaction, it cannot motivate them to have more positive and creative work attitudes and behaviors.

The study should strengthen the systematic planning of the career of physicians. Due to the lack of comprehensive consideration of motivational factors such as career achievement, job appreciation, sense of responsibility, promotion of professional titles (positions), and career development planning in the current pay-for-performance policy system implemented by Chinese public hospitals, physicians have relatively single career development channels. Moreover, the development positioning of medical talents in Chinese public hospitals is relatively vague, and there is a lack of personalized career development plans that meet the whole cycle of physicians. In the interview, over 80% of the respondents stated that the hospital did not provide them with a clear career development plan. However, this method of determining the salary of medical staff based on job ranking has to some extent discouraged their enthusiasm and initiative, which was also found by previous scholars in their assessment (Li et al., 2014).

Insufficient spiritual motivation for physicians. China's public hospitals are responsible for the healthcare work of a region, and their physicians have heavy tasks and high work intensity and need to receive a large number of patients every day. Only by continuously meeting the higher-level needs of medical staff can they achieve self-satisfaction. Therefore, invisible welfare and spiritual motivation can play important regulatory and complementary roles. The interview results show that in addition to material expectations, physicians have inherent requirements for pay-for-performance, such as psychological care and help, and value integration. However, the reality is that most public hospitals in China still lack the use of spiritual incentives such as goal incentives, growth incentives, and honor incentives for physicians in the pay-for-performance system.

3.5.1.4 Performance measurement methods in public hospitals lack of clarity

In the current hospital PFPS system, there exists a lack of rigorous differentiation between various methods of measuring physician performance. Moreover, the impacts stemming from these different methods have not been adequately elucidated. In other words, there is ambiguity regarding whether performance evaluation prioritizes outputs (such as the number of appointments) or outcomes (the health benefits to patients). Given that focusing on outputs versus outcomes represents two significantly different approaches to performance evaluation,

this disparity is likely to have implications for measuring physician performance.

3.5.2 Analysis of development strategies of hospitals' pay-for-performance based on physician professionalism

3.5.2.1 Strengthening the positive incentive of hospitals' pay-for-performance and enhancing physician professionalism

The interview found that physicians' pay-for-performance satisfaction has a positive impact on physician professionalism, that is, higher pay-for-performance satisfaction can effectively promote physician professionalism and fully mobilize physicians' subjective initiative. Therefore, strengthening the positive reinforcement of hospitals' pay-for-performance on physician professionalism, and giving full play to the baton and guiding role of hospitals' pay-for-performance, play an important role in improving physicians' pay-for-performance satisfaction and cultivating physician professionalism.

Most respondents believed that on the one hand, the pay-for-performance satisfaction among physicians in China's public hospitals is not high. Therefore, the government should fully recognize and respect physicians' labor and contributions, and in accordance with the overall guidance on the reform of China's public hospital salary system, dare to break through the current regulation of pay-for-performance in Chinese public institutions, give hospitals more autonomy, establish a scientific compensation mechanism for pay-for-performance growth, and motivate physicians to enhance their professionalism. For example, physicians could focus on how to improve the quality of medical services, enhance their own business capabilities, promote medical sharing, study medical science knowledge, focus on patients, be honest and confidential to patients, maintain doctor-patient relationships, and truly achieve the spirit of great physician that puts patients first. As stated by the SML director, "It is necessary to cooperate well with other departments, and the laboratory department also needs to master some clinical knowledge, participate in consultations, provide cooperation and support, and improve communication skills. Communication with patients is very important, which can improve patient compliance. Physicians need to improve independent learning and have clear plans for their own career and growth." Other scholars also thought that medical units should be given more autonomy to establish a compensation mechanism for pay-for-performance growth, and encourage medical staff to cultivate medical ethics, practice benevolence, and assume greater social responsibilities (Lu et al., 2019). On the other hand, as non-profit institutions, China's public hospitals shoulder the sacred mission of healing the wounded and

rescuing the dying, so they should first adhere to public welfare. Therefore, most respondents held that the government should increase financial subsidies for public hospitals, reverse their profit-seeking behavior, and promote hospitals to embark on a healthy and high-speed development track.

3.5.2.2 Hospitals should attach importance to motivating physician professionalism and providing invisible welfare

According to Maslow's Hierarchy of Needs Theory and Herzberg's motivation-hygiene factors, when lower-level needs are satisfied, people begin to pursue higher-level needs, and motivators come into play. As a result, the spiritual motivation and invisible welfare provided by public hospitals to physicians have become effective supplementary and regulatory mechanisms, which is consistent with the research of other scholars (Liu et al., 2015). Therefore, it is necessary to establish an effective and fair promotion channel for job titles and improve the career development plan for physicians, provide convenience for academic exchanges and professional training of physicians to the maximum extent and build a platform, and encourage and promote physicians to improve medical practice through continuous learning.

Firstly, public hospitals should continuously improve the construction of career development channels for physicians. As the SMY director pointed out, "Physicians should not focus on interests, but on patients' conditions. Moreover, hospitals need to address physicians' concerns in terms of salary, so that they can focus on patients' conditions without any worries and take their responsibilities. Our pre-job training has played an important role in the construction of the hospital atmosphere and culture. At the same time, we have strengthened the supervision of others and the self-supervision by physicians, as well as strengthened the supervision from the Party Committee and the Commission for Discipline Inspection." Similarly, on the one hand, it is necessary to clarify the performance requirements and responsibilities for the promotion of physicians, develop targeted career development plans based on the actual situation of physicians, and ensure that the career development of physicians moves in a predictable direction. On the other hand, an open, transparent, fair and reasonable internal selection and competition mechanism should be established to give preferential treatment to outstanding and qualified physicians in terms of salary and benefits, break through the ceiling of the physician profession and fully mobilize the enthusiasm and creativity of physicians.

Secondly, hospitals should create a happy workplace and build a platform for the growth of physicians. Strengthening the sense of belonging and high sense of gain among physicians is a

higher-level requirement for happy hospitals in the new era. Public hospitals should focus on the needs of physicians to build a caring organization, actively build a multi-level physician service system, implement the goals of happy work and happy life, and actively guide physicians to pay attention to their own spiritual life and mental health. At the same time, the SMY director held that “Sanming implements the general hospital system. The general hospital provides training to grassroots branch hospitals, enhances their primary medical service capabilities, implements the mentorship system, as junior physicians can be led by physicians with deputy senior titles for three years, and vigorously promotes the mentorship system. At the same time, experts from the general hospital are sent to the branch hospitals to promote the homogenization of medical quality between the general hospital and the branch hospitals”. This measure can effectively strengthen the brand construction of talent training projects, continuously improve the professionalism of young physicians, and improve the clinical thinking and research abilities of resident physicians. What’s more, hospitals should strengthen project cooperation with high-quality medical organizations outside China and connect with high-quality physician training programs.

Thirdly, hospitals should continuously strengthen the construction of professional ethics for physicians. Based on a series of laws and regulations such as the *Law of the People’s Republic of China on the Promotion of Basic Medical and Health Care* and the *Civil Code of the People’s Republic of China*, and with the establishment of good professional ethics as the value orientation, hospitals should increase the publicity of medical ethics, select advanced models, and vigorously promote the spirit of health profession in the new era. The SMY expert believed that “Hospitals have transformed to focus on patient service, understand patient satisfaction through patient follow-up visits and questionnaires, including honesty and trustworthiness towards patients, and commend and reward physicians for good service through patient selection every month. Through this transformation, the honesty towards patients is better achieved. Honesty towards patients means the loyalty to patients, protecting them to the greatest extent, and maximizing patients’ interests.” Hospitals should adhere to strict political, ethical, and professional standards for the selection and employment of medical personnel, develop professional ethics evaluation methods and assessment index systems for medical personnel, explore the establishment of quantitative assessment standards for medical ethics, and regard medical ethics as an important indicator for annual assessment and job appointment of medical personnel, so as to closely integrate medical ethics with the reform of salary system and fully play the positive guiding role of salary distribution.

3.5.2.3 Improving the pay-for-performance assessment system, and adhering to a high degree of integration with the development of professionalism

When conducting the pay-for-performance distribution in public hospitals, it is necessary to ensure that the hospital's development goals, salary distribution indicators, and performance evaluation indicators are in harmony with the advocated core values, hospital culture, and professionalism, and guide physicians to follow the life ethics of humanistic utilitarian and adhere to the public welfare of public hospitals (Chen & Feng, 2014). This is similar to the perspective of the SML director, who believed that “There are many annual salary indicators, which constrain the behavior of physicians, such as the proportion of traditional Chinese medicine decoction pieces, how much the proportion of drug consumables should be less than, and how much medical service income should reach. These indicators reduce the waste of unreasonable medical resources. Pay-for-performance assessment also includes the calculation of work points. On the one hand, more pay for more work, and on the other hand, the higher the quality is, the higher the work points will be. Pay-for-performance also assesses physicians' business, workload, and technical difficulty, which promotes the maximization of the efficacy and better control the cost”.

First of all, public hospitals should establish a sound performance evaluation system. Public hospitals should establish and improve scientific and reasonable quantitative assessment standards and change the current assessment mode based on economic indicators. Factors such as working hours, work efficiency, work experience and technical level should be included in the assessment index system, and physicians' payment should be directly linked to patient satisfaction, job responsibilities, work intensity and work risk coefficient, with a focus on key medical positions, positions in a shortage and young physicians, so as to establish the income distribution principle of more pay for more work and better pay for better work. Public hospitals need to explore the medical quality assessment index system based on the core medical system and the clinical pathway, and gradually guide physicians to provide high-level diagnosis and treatment services, so as to eliminate the profit-seeking behavior of public hospitals. The SMT expert held that “We should pay for performance, promote diagnosis and treatment by the team, adopt treatment groups, so that the team can ensure the maximum effect of diagnosis and treatment, and also ensure that physicians receive reasonable pay. It can ensure a decent life for physicians, and promote their efforts and medical outcomes”.

Secondly, public hospitals should establish a fair and transparent disclosure mechanism for evaluation results. It is necessary to eliminate the phenomenon of seniority-based salary

distribution in public hospitals, and to eliminate the distorted pay-for-performance distribution system that emphasizes academic qualifications and professional titles and ignores abilities and skills, so as to stimulate the enthusiasm and creativity of physicians. The SML expert thought that “We should establish regulations and systems. The hospital has ten core systems and ten safety medical service quality, and then regularly checks the implementation. The hospital provides training and exam guidance to physicians and technicians every year, and then supervises and rectifies existing problems, continuously makes improvements, and makes some assessment results transparent open and transparent within the group”. In the process of formulating performance appraisal and salary distribution plans, public hospitals should take professional titles, academic qualifications, and years of experience as the basic indicators, and should also consider soliciting suggestions and opinions from front-line clinical physicians. In the implementation process, it is necessary to clarify standards, quantify assessments, and focus on feedback to ensure the transparency of all links and avoid unfair feelings among physicians due to information asymmetry.

3.5.2.4 Using scientific management methods to improve physicians’ pay-for-performance satisfaction, and enhance physician professionalism

Public hospitals should take the development of human resource systems as the starting point, and gradually realize the scientific and standardized business and process of salary management by speeding up the process of information construction, thus changing the traditional extensive management mode in the past, gradually achieving closed-loop management from personnel turnover, salary adjustment, attendance management, and salary distribution, and establishing a sharing and coordination mechanism for information resources of multiple departments such as personnel and finance. For example, the SMC director believed that “The hospital will regularly evaluate the implementation of the system, such as the doctor-patient communication system, and the supervision and assessment will be linked to performance. Only when physicians are more responsible for their duties can they get higher performance, so as to promote physicians to be more responsible for their duties”. The SMY director believed that “Physicians should strengthen communication and collaboration capabilities. First, physicians should strengthen the ability to communicate and collaborate with patients’ families, nurses and other doctors, including listening skills, expression skills and problem-solving skills, and improve the literature reading and research abilities, which is an important way for physicians to obtain the latest medical knowledge and research results”. In addition, public hospitals can learn from advanced management and performance distribution paradigms in China and abroad,

use the balanced scorecard (BSC) to grasp the key performance indicators (KPI) in the hospital's salary distribution system, and transform hospital strategic goals into four dimensions (namely finance, hospital, internal processes, learning and growth), or introduce Harvard University's resource-based relative value scale (RBRVS) approach, and incorporate patient satisfaction, research achievements, new technology application, job risk, and influence degree of theses in the index system, to comprehensively measure and evaluate the work performance of physicians from different levels and dimensions, in order to enhance physician professionalism. The research of Zhang et al. (2019) is consistent with the results of this interview.

3.5.2.5 Integrating healthcare outputs and outcomes in physician performance evaluation

Central to physician performance evaluation is effectively incentivizing medical professionals based on both healthcare outputs (such as the number of patients treated) and healthcare outcomes (the benefits accrued by patients). Presently, many countries beyond China are undergoing reforms in healthcare payment methods, with a focus on value as the core principle. This includes initiatives like performance-based payments and bundled payments. Value-based Payment (VBP) is a payment model that, as described by Korenstein et al. (2016), aims to establish purchasing plans based on the value of healthcare services, rewarding providers who deliver high-value healthcare while reducing financial support for underperforming providers. As stated by the Director of SME, "VBP is an ideal method for controlling rising healthcare costs and effectively improving the quality of healthcare services. Achieving VBP requires adopting a patient-centered approach to healthcare services, establishing standardized measures of efficacy, implementing clear mechanisms for measuring the true cost of medical processes, and establishing value-based purchasing plans for healthcare services. Only through VBP can healthcare costs be effectively managed, quality improved, and value-based healthcare achieved. In the VBP model, the income of healthcare service providers is determined by the assessed value of care provided to residents/patients, rather than the quantity of services provided." Competition among healthcare service providers should revolve around enhancing the perceived value of healthcare services by residents/patients, which should also serve as the standard and basis for healthcare payment. In recent years, the development of standardized efficacy measurement and the utilization of Time-Driven Activity-Based Costing (TDABC) methodology, as highlighted by Li (2018), are poised to facilitate the realization of value-based payment methods. As articulated by the Director of SMX, "Regarding the evaluation of healthcare outputs (such as the number of patients treated), we can employ performance

assessment methods based on per capita payment for physicians participating in China's family doctor contract services. However, the objectivity and accuracy of performance evaluation results based on per capita payment still warrant discussion. For instance, the daily patient intake differs between general practitioners and specialists within the same hospital. Hence, we can enhance performance evaluation through innovative incentive mechanisms for healthcare outputs (patient input) and healthcare outcomes (patient benefits). For example, on the basis of value-based healthcare theory, we are exploring the design of incentive measures for physician performance based on value payment adjustments to per capita payment, thereby establishing a self-driven incentive mechanism for physicians within a value-based healthcare model. In evaluating the implementation effects, this study will employ community experiments and utilize a comparative design methodology with pre-intervention (per capita payment without value payment adjustments) and post-intervention (per capita payment with value payment adjustments) controls to assess the effectiveness of the incentive mechanisms. Indeed, through systematic comparison of the performance indicators and incentive mechanisms of healthcare systems under per capita payment with and without value payment adjustments, this study aims to provide scientific evidence for improving the incentive mechanisms for physician performance evaluation in China and offer policy insights for the further promotion of China's physician performance evaluation system." Indeed, by comparing the performance indicators and incentive mechanisms of healthcare systems under per capita payment with and without value payment adjustments, this study aims to refine China's physician performance evaluation and incentive mechanisms, providing a scientific basis and policy reference for the continued advancement of the evaluation system

Chapter 4: Development of the Physician Professionalism Scale

Based on the discussion of the basic theories and core concepts of physician professionalism in Chapter 2 and Chapter 3, the qualitative meta-analysis method will be used in this chapter to construct the dimensions and form an initial scale of physician professionalism. The initial scale is analyzed through the qualitative study of the quantitative data with the reliability and validity analysis, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA), the formal Physician Professionalism Scale (PP-Scale) is formed, and its effectiveness is initially verified.

4.1 Construction of the dimensions of “physician professionalism” based on qualitative meta-analysis

In view of the fact that current studies on physician professionalism are mostly empirical research, this thesis draws on the idea of “integration” from the qualitative meta-analysis method, and refines and summarizes the published empirical studies to construct a more universal conceptual framework of physician professionalism. Because the perspectives and implementation strategies of the existing empirical studies vary greatly, their results are fragmented and isolated. The implementation strategy of qualitative meta-analysis method is to systematically integrate empirical studies with similar themes for reanalysis and comparison, so as to interpret the findings and supporting evidence of existing studies, and then condense the various categories in different empirical studies, boosting the systematic interaction and effective integration of knowledge. Qualitative meta-analysis method can also identify implicit knowledge undiscovered in the past empirical studies and therefore provide new nutrients for the current knowledge system. So, it is particularly suitable for the current theoretical development of “fragmentization” in the research of physician professionalism, which helps to establish a systematically integrated and interactive conceptual framework of physician professionalism.

4.1.1 Sample selection for qualitative research

The data for qualitative meta-analysis is from the results of existing empirical research. In order

to ensure data quality, the sample is limited to the published academic theses in the core journals of empirical research, and at the same time, the researchers need to exclude those articles published in consulting reports or newspapers to ensure the high quality of the research sample. To fully explore the theories involved in the research on physician professionalism, this section studies the articles published up until 2022 regarding physician professionalism through bibliometrics, with a focus on reviewing the theories and mechanisms of physician professionalism. A structured search of the PubMed database and the Web of Science (WOS) core database was conducted to obtain as many relevant articles as possible. In addition to “professionalism”, 33 terms related to physician professionalism were also used as keywords for the search (Azer & Azer, 2019). The initial retrieval obtained 109 empirical research papers that met the requirements. Further, according to scholars’ recommendations for the exclusion rules of literature for qualitative meta-analysis (Rousseau et al., 2008), the following types of literature were excluded: (1) published studies of little relevance to the study; (2) published studies in disciplines such as cognitive psychology, philosophy, and religion, that explore the physiological or psychological effects on individual or group behavior; and (3) published studies unrelated to physician professionalism. So, 90 articles were excluded. Finally, after eliminating some less relevant studies, a total of 19 empirical research articles on physician professionalism were selected.

4.1.2 Qualitative analysis of research data

Following the operational procedures of qualitative meta-analysis, the study excerpted, coded and categorized the selected samples. First, in the excerpting stage, the study identified 182 original words, phrases, and key findings regarding physician professionalism in the samples, and then coded these words and phrases. During the coding stage, the study conducted a two-phase coding approach as per scholars’ recommendations for data analysis in qualitative meta-analysis (Gioia et al., 2013).

In the coding process, a “labeling” approach was adopted to accurately and honestly depict the observed phenomena in strict accordance with the original expressions in the study samples, labeling each segment one by one while retaining the original statements to the greatest extent. Meanwhile, the study repeatedly identified and compared the labels, eliminated the ones less related to physician professionalism, and merged the semantically repetitive labels to extract initial categories that accurately summarize the theme. This coding in this stage was conducted independently by 2 researchers, who compared and discussed every sample after the coding. A total of 89 valid labels and 44 initial categories were generated in this phase.

In the categorization process, the study generalized the initial categories with juxtapositions and affiliations into higher dimensions with more abstract meaning. In this process of theorization, the researchers fully referred to the concepts and theories in the existing literature. For instance, the researchers drew on the concept of “ethical responsibility” in the field of physician professionalism, and based on the initial categories like “improving the medical service quality” included in the implications that “physicians should update their knowledge and skills in a timely manner, and continuously improve their professional competence”, emphasized by “physicians should strive to improve the medical service quality”. So, the study refined it as a higher dimension of “improving the medical service quality”. In addition, during the coding process of this phase, the researchers also focused on the phenomena that were not adequately summarized in existing literature and explored their implicit meanings. After repeated comparisons and iterations in this phase, the researchers retrieved a total of 15 themes from five dimensions of professional attitudes and behaviors, such as the basic norms, new technologies, and the application of new therapies, medical practice, cultivation and inheritance, medical and social value of physician professionalism, which can explain the concepts and connotation of physician professionalism more clearly and completely.

4.1.3 Interpretation of qualitative analysis results

The following parts elaborate separately each theme of the five dimensions of physician professionalism and the logic relationship between each dimension to completely construct the conceptual system of physician professionalism. This study analyzes and summarizes the research of scholars in China and abroad on physician professionalism in terms of the integration, interaction, and systematicity of the 15 themes in these five dimensions (see Table 4.1).

Table 4.1 Main research perspectives, main researchers, and conclusions of physician professionalism

Dimension	Topic	Main researcher	Conclusion
Basic norms	1) Respecting patients and caring for life 2) Adhering to medical ethics and standardizing medical practice 3) Rigorous scholarship and meticulous practice	Liu (2017); Lu and Mao (2019); Sun (2006); Yue et al., (2018);	Emphasizing professional ethics and professionalism
New technologies, and the application of new therapies	1) In ancient times it emphasized the benevolence of physicians, respect for life, and pursuit of exquisite medical skills	Xie (2016); Wiesing and Parsa-Parsi (2016); Zhao and Lu (2017)	Emphasizing that physicians should not only pay attention to the scientific spirit or scientific development outlook, but also adapt to the requirements of the times in terms of the continuous

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Dimension	Topic	Main researcher	Conclusion
Medical practice	2) In recent times it emphasizes scientific spirit, humanitarian spirit, and professional ethics.	J. Chen et al. (2013)	improvement of medical quality
	3) In modern times it emphasizes social responsibility, continuous learning, and patient-centered care.		
	1) During the process of diagnosis and treatment it focuses on respect for patients, scientific attitude, and sense of responsibility.		
	2) During the surgical process it emphasizes strict adherence to operating standards, attention to details, and teamwork.		
Cultivation and inheritance	3) During the nursing process it emphasizes care for patients, carefulness and patience, and teamwork.	Hillis and Grigg (2015); Hochberg et al. (2012); Hultman et al. (2012); Kirch et al. (2015);	One of the effective strategies to enhance the physician professionalism and improve diagnosis and treatment practices
	1) Focusing on medical ethics education, professional ethics education, and legal and regulatory education.		
	2) Focusing on clinical practice, academic exchange, and participation in public welfare activities.		
	3) Focusing on setting an example, inheriting experiences, and social publicity.		
Medical and social value	1) Improving the medical service quality 2) Promoting harmonious doctor-patient relationships 3) Promoting the development of medical and healthcare	Xie (2016)	Significantly improving physician professionalism and enhancing their ability to integrate into clinical practice. Strengthening physician professionalism can effectively improve the medical service quality and doctor-patient relationships, and promote the development of the medical and healthcare.

In summary, the research by scholars on physician professionalism mainly lies on its basic norms, new technologies, and the application of new therapies, medical practice, cultivation and inheritance, and social value of healthcare.

Scholars mainly focus on the following aspects of the basic norms of the physician professionalism: (1) Respecting patients and caring for life, advocating patient first, prioritizing patient interests, respecting patients' rights and dignity as well as caring for patients' physical and mental health and quality of life; providing humanistic care for the emotional and psychological needs of patients, treating them with a warm, caring, and inclusive attitude, and establishing a good doctor-patient relationship (Lu & Mao, 2019; Yue et al., 2018); putting life first, respecting life, caring for life, and making every effort to safeguard the safety and health interests of patients. (2) Adhering to medical ethics and standardizing medical practice. Being honest and trustworthy, that is paying attention to the professional ethics of physicians, not exaggerating the efficacy, not concealing medical risks and adverse consequences. Being diligent and dedicated, emphasizing being serious and responsible for medical work, spare no effort, disregarding personal gains and losses, and providing high-quality medical services to patients. Exercising strict self-discipline, maintaining an honest and upright medical ethics and style, not accepting unfair benefits such as red envelopes and kickbacks from patients, and maintaining the sanctity and dignity of medicine. (3) Rigorous scholarship and meticulous practice. Academic integrity requires physicians to adhere to a scientific attitude, respect scientific laws, truthfully record research data and results, and eliminate academic misconduct. Exquisite skills require physicians to continuously improve their medical knowledge and skills, use advanced medical technology and equipment to provide patients with accurate and effective diagnosis and treatment services (Liu, 2017; Sun, 2006). Continuous improvement requires physicians to constantly summarize clinical experience, explore new treatment methods and technologies, promote medical technology, and improve medical quality and safety.

Scholars mainly focus on the following aspects of the new technologies and the application of new therapies of the physician professionalism: (1) The origin of physician professionalism in ancient times emphasized the benevolence of physicians, respect for life, and pursuit of exquisite medical skills. The viewpoint that emphasizes the benevolence of physicians believes that physicians should have noble character and benevolence, take it as their responsibility to rescue patients, and disregard personal gains, losses, and risks. The viewpoint that emphasizes respect for life believes that life is supreme, therefore physicians should treat patients with great caution and pay attention to their feelings and needs. The viewpoint that emphasizes pursuit of exquisite medical skills believes that physicians should attach great importance to the mastery and inheritance of medical skills. With long-term practice and experience accumulation, master numerous valuable medical theories and skills have been formed (Xie, 2016). (2) The development of physician professionalism in recent times emphasizes scientific spirit,

humanitarian spirit, and professional ethics. Scientific spirit advocates the development of medical science, pays more attention to the scientific spirit, respects medical laws, and follows scientific methods for diagnosis and treatment. The humanitarian spirit places greater emphasis on the human rights and dignity of patients, treats patients equally, and pays attention to their mental health and rights protection (Wiesing & Parsa-Parsi, 2016). Professional ethics advocates compliance with medical ethics and professional ethics, while bribes and improper benefits are not allowed. (3) To improve physician professionalism in modern times, the emphasis should be placed on social responsibility, continuous learning, and patient first. The theory of social responsibility requires modern physicians to pay more attention to their social responsibility, actively participate in public health affairs and public welfare activities, and make contributions to society. The view of continuous learning requires modern physicians to pay more attention to continuous learning and knowledge updating, constantly master the latest medical theories and skills, and improve their professional competence. Patient first emphasized that modern physicians should place greater emphasis on the principle of patient first, take the needs and interests of patients into account, and make every effort to provide high-quality and comprehensive medical services for patients (Zhao & Lu, 2017).

The physician professionalism in medical practice is mainly reflected in: (1) During the process of diagnosis and treatment, it mainly focuses on respect for patients, scientific attitude, and sense of responsibility. Respect for patients refers to that physicians should respect the rights of dignity, autonomy, and privacy of patients, follow the principle of informed consent, and provide detailed and patient explanations and consultation services to patients. Scientific attitude requires physicians to maintain a scientific, objective, and impartial attitude, not to exaggerate therapeutic effects, not to conceal risks, and not be influenced by non-scientific factors (J. Chen et al., 2013). Sense of responsibility refers to that physicians should take responsibility for the health and life of patients, carefully examine, diagnose, and treat patients, and make every effort to protect the interests of patients. (2) Professionalism during the surgical process includes strict adherence to operating standards, attention to details, and teamwork. Physicians should strictly adhere to operation specification to ensure the safety and smooth progress of the surgery. Physicians should pay attention to every detail during the surgery, including disinfection, anesthesia, and hemostasis, to ensure the best surgical outcomes. Physicians should work closely with surgical team members to complete the surgery together, ensuring surgical quality and patient safety. (3) Professionalism during the nursing process includes care for patients, carefulness and patience, and teamwork. Nurses should care for, take good care of, and respect patients, and provide warm and comfortable nursing services for them.

Nurses should carefully and patiently observe and take care of patients, promptly identify and solve their problems and needs. Nurses should work closely with doctors and other medical workers to jointly take responsibility for the health and safety of patients.

The cultivation and inheritance of physician professionalism are mainly reflected in: (1) The education and training of physician professionalism should focus on such three aspects as medical ethics education, professional ethics education, and legal and regulatory education. That is, through medical ethics education, physicians should be trained to abide by medical ethics, pay attention to the rights and well-being of patients, and establish a patient-centered service concept. Through professional ethics education physicians should strengthen their professional ethics, including medical ethics, medical conduct, and professional etiquette to enhance the professional image and ethics of physicians. Through legal and regulatory education, physicians can understand and comply with relevant laws and regulations, strengthen their awareness of medical practice in accordance with the law, and improve the quality and safety of medical care. (2) The practice of physician professionalism includes such three aspects as clinical practice, academic exchange, and participation in public welfare activities, that is, to cultivate the physician professionalism, emphasize care, respect, and consideration for patients, and improve their practical ability and doctor-patient communication abilities through clinical practice. Through academic exchange activities, physicians can understand and master the latest medical trends and diagnostic and treatment technologies, improve their professional level and medical service capabilities. It encourages physicians to participate in public welfare activities, pay attention to public health and social responsibility, and enhance social image and influence (Hillis & Grigg, 2015; Hochberg et al., 2012; Hultman et al., 2012; Kirch et al., 2015). (3) The inheritance and promotion of physician professionalism include setting an example, inheriting experiences, and social publicity, that is, setting an example of excellent physicians in the industry, and motivating more physicians by promoting the deeds and spirit of excellent physicians. It emphasizes the inheritance of experience from senior physicians, encouraging young physicians to learn from them, inherit and carry forward excellent medical traditions and culture. It promotes the importance and value of physician professionalism to the public through media and social publicity, so as to enhance social recognition and support for physician professionalism.

The impact and value of physician professionalism on society are mainly reflected in: (1) Improving the quality of medical services, that is, the core of physician professionalism is to care for life, respect patient rights, and provide high-quality, safe, and efficient medical services for patients. Physician professionalism encourages them to continuously learn medical

knowledge, improve medical skills to better provide medical services to patients. Physician professionalism is also reflected in strict control of the medical process, reducing the occurrence of medical errors and accidents, and improving the safety and reliability of medical services (Xie, 2016). (2) Promoting harmonious doctor-patient relationships. Physician professionalism emphasizes the respect and understanding of patients, pays attention to patients' psychological needs, and establishes good communication and trust relationships with patients. Physician professionalism encourages them to provide comprehensive medical services and health guidance to patients so as to improve patient satisfaction and trust. Physician professionalism helps to alleviate doctor-patient conflicts, reduce medical disputes, and maintain social stability and harmony. (3) Promoting the development of medical and health care. Physician professionalism is an important driving force for the development of healthcare, which play a role in encouraging them to innovate and keep forging ahead, promoting the progress and development of medical technology. It is also reflected in their concern for and participation in public health, promoting the development of epidemic prevention and health promotion, as well as promoting the comprehensive progress and development of medical and healthcare.

4.2 Development and implementation of the Physician Professionalism Initial Scale (PPI-Scale)

4.2.1 Generation of the PPI-Scale

The items of the initial scale have two sources. First, it used the deductive method. Based on the above five dimensions and 15 themes of physician professionalism, some items for measurement were selected with the help of relevant representative literature. The study will adjust the labels obtained from the context of basic norms, new technologies, and the application of new therapies, medical practice, cultivation and inheritance, and medical and social values of the physician professionalism, and combine them with the labels obtained from qualitative data coding to adapt to the characteristics of physician professionalism. 17 more semantically clear measurement items have been obtained as shown in Table 4.2.

Table 4.2 Items of the PPI-Scale obtained from literature analysis

No.	Item
1	Physicians should strive to improve the medical quality.
2	Physicians should be involved in the evaluation of the medical quality provided by their colleagues.
3	Physicians should proactively report their own adverse medical events.
4	Physicians should report incompetent colleagues to their leaders or relevant

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

No.	Item
	departments.
5	Physicians should continuously update and improve their knowledge and skills.
6	Physicians should fully inform patients of the advantages, disadvantages and risks of treatments.
7	Physicians should inform the affected patients and/or their families when a major medical error occurs.
8	Physicians should be factual rather than mislead patients into making unreasonable medical choices.
9	Physicians should keep the patient's condition and personal privacy confidential.
10	Physicians should provide basic medical services regardless of the patient's ability to pay.
11	For patients with financial difficulties, physicians should try to choose cost-effective treatment options.
12	Physicians should treat patients equally regardless of their ethnicity, gender, wealth, status and religious beliefs.
13	Health knowledge should be disseminated to the communities in an accessible manner.
14	Physicians should follow guidelines for diagnosis, treatment and medication, and carry out reasonable examination, treatment and medication.
15	Physicians should evaluate their colleagues' professional abilities and personal qualities fairly and objectively.
16	Physicians should not denigrate one another or inappropriately impede patients' trust in their peers.
17	Physicians should put patients' interests above their personal interests.

The second is to interview medical management research experts with doctoral degrees or senior professional titles, as well as medical experts engaged in the frontline of medical care, extract the interview content, and prepare the items of the scale. 5 Chinese medical experts and 5 health management experts with over 15 years of management experience in the medical field were selected for telephone and face-to-face interviews. At the same time, qualitative research methods were adopted to extract content related to basic norms, new technologies, and the application of new therapies, medical practice, cultivation and inheritance, and medical and social values of physician professionalism, and developed into the items of a scale. In this stage, 9 items are shown as shown in Table 4.3.

Table 4.3 Items of the PPI-Scale obtained from interviews

No.	Item
1	1. Discriminating patients in medical services by wealth, status, gender, and ethnicity
2	2. Providing extra medical services to patients with medical insurance
3	3. Concealing from patients and their families' adverse medical events that they should know about
4	4. Providing necessary medical services to patients who can't afford them
5	5. Using critical thinking to learn or apply new knowledge and technology
6	6. Disclosing patients' information inappropriately to uninvolved persons
7	7. Accepting property from patients, their families and friends
8	8. Accepting property, kickbacks and other improper benefits from pharmaceutical companies or personnel

- | | |
|---|--|
| 9 | 9. Discussing with or seeking help from colleagues to obtain reasonable diagnosis and treatment plan when personal skills are limited. |
|---|--|

In summary, a total of 26 semantically clear measurement items of the scale were obtained from the above two sources. Finally, to ensure the content validity of the scale, two senior researchers in the medical field, a chief physician with a senior professional title in a grade A tertiary hospital and a senior professor from a renowned medical school, were invited to conduct qualitative evaluation of the entries to determine their comprehensibility, accuracy, and representativeness. Then, based on the opinions of experts, the problematic entries were modified, and the initial measurement scale with the first 21 entries were determined and divided into corresponding five dimensions (see Table 4.4).

Table 4.4 The PPI-Scale

Dimension	Item
Basic norms	1. Physicians should fully inform patients of the advantages, disadvantages and risks of treatments.
	2. Physicians should be factual rather than mislead patients into making unreasonable medical choices.
	3. Physicians should keep patients' condition and their privacy confidential.
	4. Physicians should put patients' interests above their personal interests.
	5. Physicians should provide basic medical services regardless of the patient's ability to pay.
New technologies and the application of new therapies	6. Physicians should follow guidelines for diagnosis, treatment and medication, and carry out reasonable examination, treatment and medication.
	7. Physicians should continuously update and improve their knowledge and skills.
	8. Physicians should use critical thinking to learn or apply new knowledge and technology.
Medical practice	9. Physicians should integrate traditional and new therapies to provide valuable diagnosis and treatment services.
	10. Physicians should strive to improve the medical quality.
	11. Physicians should be involved in the evaluation of the medical quality provided by their colleagues.
	12. Physicians should proactively report their own adverse medical events.
Cultivation and inheritance	13. Physicians should report incompetent colleagues to their leaders or relevant departments.
	14. Physicians should disseminate health knowledge to the communities in an accessible manner.
	15. Physicians should evaluate their colleagues' professional abilities and personal qualities fairly and objectively.
	16. Physicians should not denigrate one another or inappropriately impede patients' trust in their peers.
Medical and social value	17. Physicians should discuss with or seek help from colleagues to obtain reasonable diagnosis and treatment plan when personal skills are limited.
	18. In medical services, physicians should not discriminate patients by wealth, status, gender, or ethnicity.
	19. For patients with financial difficulties, physicians should try to choose cost-effective treatment options.
	20. Physicians should not accept property, kickbacks and other improper benefits given by pharmaceutical enterprises or personnel.

Dimension	Item
	21. Physicians should provide comprehensive medical services and health guidance to patients.

4.2.2 Selection of objects and methods for measurement

The PPI Scale was measured through offline questionnaire distribution. Since the object of this scale is medical practice activities, it is necessary to consider that the tested unit has high willingness of abiding by professional professionalism and high-frequency behavior of the professional professionalism for discussion. Therefore, two grade A tertiary hospitals in Sanming City, Fujian Province were selected in this study for questionnaire distribution. These selected hospitals have a strong subjective and objective desire for the professional professionalism, which meets the requirements of the physician professionalism scale (PP-Scale).

This questionnaire was distributed and collected face-to-face from November 10, 2023 to November 20, 2023, and the physicians tested answered it during non-working hours. Then it was collected by the distributor the next day. A total of 963 questionnaires were distributed in this survey, and after excluding invalid questionnaires collected, 824 valid questionnaires remained, with a recovery rate of 85.57%. In terms of gender, there are a total of 534 women (64.81%) and 290 men (35.19%). In terms of age, the average age is 32.52 years old, from 22 to 68 years old. In terms of educational backgrounds, there are 22 individuals with associate degrees or below (2.67%), 527 individuals with bachelor's degrees (63.96%), 240 individuals with master's degrees or above (29.13%), and 35 individuals with doctoral degrees (4.25%). In terms of post, there are 596 resident physicians (72.33%), 168 attending physicians (20.39%), 48 deputy chief physicians (5.83%), and 12 chief physicians (1.46%). In terms of work experience, 180 people (21.84%) have worked for less than 5 years, 302 people (36.65%) have worked for 6-15 years, 162 people (19.66%) have worked for 16-25 years, 111 people (13.47%) have worked for 26-35 years, and 69 people (8.37%) have worked for 36 years or more. In terms of departments, there are 190 people in the internal medicine department (23.06%), 183 people in the surgery department (22.21%), 180 people in the obstetrics and gynecology department (21.84%), 160 people in the pediatrics department (19.42%), and 111 people in the emergency department (ICU) (13.47%), as shown in Table 4.5.

Table 4.5 Demographic information

Item	Group	Case	Proportion
Gender	Female	534	64.81%
	Male	290	35.19%
Age	Below 30	285	34.59%
	31-40	312	37.86%
	41-50	166	20.15%
	51-60	45	5.46%
	Over 61	16	1.94%
	Doctoral degree	35	4.25%
Education background	Master's degrees	240	29.13%
	Bachelor's degree	527	63.96%
	Associate degree or below	22	2.67%
Title	Resident physicians	596	72.33%
	Attending physicians	168	20.39%
	Deputy chief physicians	48	5.83%
	Chief physicians	12	1.46%
Working years	Within 5 years	180	21.84%
	6-15 years	302	36.65%
	16-25 years	162	19.66%
	26-35 years	111	13.47%
	Over 36 years	69	8.37%
Department	Internal medicine	190	23.06%
	Surgery	183	22.21%
	Obstetrics and gynecology	180	21.84%
	Pediatrics	160	19.42%
	Emergency	111	13.47%

4.3 Analysis of the PP-Scale

4.3.1 Project analysis

A quantitative analysis was conducted on the 21 entries of the PPI Scale, and each entry had a relatively good social identity. The mean range of each entry is from 3.654 to 4.563, indicating that there are no outliers in each item. The standard deviation range of each entry falls between 0.523 and 0.751, with a relatively even distribution and no outliers found. The range of the comprehensibility level of each entry falls between 0.713 and 0.824, indicating that each entry has a moderate level of comprehensibility, which are easy to understand and has no ambiguity.

4.3.2 Exploratory factor analysis (EFA)

The total sample size tested was $N = 824$, and was randomly divided into two equal groups (both with a sample size of $N = 412$) for EFA and CFA, respectively. Firstly, one set of samples was used for EFA on the measurement entries of the PP-Scale. The results of the analysis showed that the KMO index value was 0.930, higher than the standard of 0.700, which means

that the sample size of the questionnaire in this study was relatively sufficient (Kline & Little, 2011). The significance level of the value of Bartlett's Test of Sphericity of the sample is $0.000 < 0.001$, indicating that CFA is suitable. The chi-square value is 8486.126, and the degree of freedom is 360. When adopting SPSS 24 for EFA, principal component analysis (PCA) and maximum variance oblique rotation were used, during which a total of 5 factors with eigenvalues greater than 1 were extracted, which accounted for 76.824% of the total variance. In EFA, items with factors loading less than 0.500 or multiple loads with different factors were removed accordingly. In the EFA of this study, one inappropriate item was deleted, which was "receiving property, kickbacks, and other improper benefits from pharmaceutical companies or personnel". After repeated factor analysis, 20 items remained ultimately in the employee innovation behavior scale, which were evenly and reasonably distributed among 5 factors, explaining 79.221% of the variance (see Table 4.6). The 5-factor model is consistent with the hypothesis corresponding to questionnaire measurement, that is, the PP-Scale is composed of five factors, the dimensions of basic norms, new technologies, and the application of new therapies, medical practice, cultivation and inheritance, and medical and social value. The variance contribution rates of these five factors were 14.226%, 16.384%, 16.445%, 15.993%, and 16.173%, respectively. The specific entries ultimately determined are also presented in Table 4.2. There are 5 items in F1 (the basic norms of physician professionalism), 4 in F2 (the new technologies and the application of new therapies of physician professionalism), 4 in F3 (the medical practice of physician professionalism), 4 in F4 (the cultivation and inheritance of physician professionalism) and 3 in F5 (the medical and social value of physician professionalism).

Table 4.6 Factor matrix of the PP-Scale (n = 412)

Entry	Factor loading	Entries	Factor loading
Basic norms (F1)		New technologies and the application of new therapies (F2)	
PPC1 Physicians should fully inform patients of the advantages, disadvantages and risks of treatments.	0.782	PPD1 Physicians should follow guidelines for diagnosis, treatment and medication, and carry out reasonable examination, treatment and medication.	0.652
PPC2 Physicians should be factual rather than mislead patients into making unreasonable medical choices.	0.744	PPD2 Physicians should continuously update and improve their knowledge and skills, and continuously improve their professional competence.	0.726
PPC3 Physicians should keep patients' condition and their privacy confidential.	0.719	PPD3 Physicians should use critical thinking to learn or apply new knowledge and technology.	0.648

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Entry	Factor loading	Entries	Factor loading		
PPC4 Physicians should put patients' interests above their personal interests.	0.738	PPD4 Physicians should integrate traditional and new therapies to provide valuable diagnosis and treatment services.	0.805		
PPC5 Physicians should provide basic medical services regardless of the patient's ability to pay.	0.689				
Medical practice(F3)		Cultivation and inheritance(F4)			
PPM1 Physicians should strive to improve the medical quality.	0.822	PPC1 Physicians should disseminate health knowledge popular to the communities in an accessible manner.	0.735		
PPM2 Physicians should be involved in the evaluation of the medical quality provided by their colleagues.	0.793	PPC2 Physicians should evaluate their colleagues' professional abilities and personal qualities fairly and objectively.	0.811		
PPM3 Physicians should proactively report their own adverse medical events.	0.776	PPC3 Physicians should not denigrate one another or inappropriately impede patients' trust in their peers.	0.664		
	0.803	PPC4 Physicians should discuss with or seek help from colleagues to obtain reasonable diagnosis and treatment plan when personal skills are limited.	0.698		
PPM4 Physicians should report incompetent colleagues to their leaders or relevant departments.					
		Medical and social value(F5)			
PPV1 In medical services, physicians should not discriminate patients by wealth, status, gender, or ethnicity.	0.765	PPV3 Physicians should provide comprehensive medical services and health guidance to patients.	0.743		
PPV2 For patients with financial difficulties, physicians should try to choose cost-effective treatment options.	0.696				
Factor name	Basic norms (F1)	New technologies and the application of new therapies (F2)	Medical practice (F3)	Cultivation and inheritance (F4)	Medical and social value (F5)
Eigenvalue	3.336	3.112	2.455	4.411	3.882
Variance contribution rate	14.226%	16.384%	16.445%	15.993%	16.173%
Total variance contribution rate	14.226%	30.610%	47.055%	63.048%	79.221%

4.3.3 Confirmatory factor analysis

Regarding CFA, another set of samples (n = 412) was used to test the degree of fitting between the conceptual model and the observed model. When conducting CFA, four comparative

models (i.e., single-factor model, two-factor model, three-factor model, and four-factor model) and this model (five-factor model) were proposed to better validate the accuracy of the conceptual model.

Firstly, in addition to the conceptual model (the five-factor model (M5)), four models, M1, M2, M3, and M4, were set up in this study to determine the optimal model through comparison. M1 refers to a single-factor model (assuming that all 20 items represent physician professionalism in one dimension). Correspondingly, M2 is a two-factor model, M3 is a three-factor model, M4 is a four-factor model, and M5 is the conceptual model (also known as the five-factor model). The results of EFA are constructed based on the theory of physician professionalism, which includes five factors: basic norms, new technologies, and the application of new therapies, medical practice, cultivation and inheritance, and medical and social value of physician professionalism. CFA was conducted on the five-factor model of physician professionalism (see Table 4.7), and the analysis results showed that in the five-factor model $\chi^2 = 485.336$, $df = 182$, and $\chi^2/df = 2.667$ (χ^2/df is less than the standard value of 3), indicating that the model is optimal. RMSEA = 0.071, and SRMR = 0.036, both below the standard value of 0.8. CFI = 0.952, and TLI = 0.945, both values are higher than the standard value of 0.900 (Kline & Little, 2011; Os, 2001). The comparison between the data observed and the fitting number from the conceptual model and other compared models is shown in Table 4.1. According to the analysis results in Table 4.1, it is found that compared with other models (M1, M2, M3 and M4), the TLI and CFI values of M5 (the conceptual model) have significantly increased, the χ^2/df value has also significantly decreased, and the values of RMSEA and SRMR have also significantly decreased. In summary, the conceptual model (the five-factor model) is superior to other compared models. The factor model analysis results of the PP-Scale tend to support the well-fitting five-factor model M5 (Kline & Little, 2011; Os, 2001). Therefore, the structure of the conceptual model (the five-factor model) has been effectively validated.

Table 4.7 Model fit of the physician professionalism scale (n = 412)

Model	χ^2	df	χ^2/df	RMSEA	SRMR	CFI	TLI
M5	485.336	182	2.667	0.071	0.036	0.952	0.945
M4	683.460	192	3.543	0.079	0.040	0.918	0.908
M3	856.335	198	4.325	0.088	0.043	0.902	0.893
M2	1075.556	201	5.351	0.106	0.504	0.865	0.849
M1	1382.664	203	6.811	0.128	0.641	0.831	0.815

Note: M5: F1, F2, F3, F4, F5; M4: F1+F2, F3, F4, F5; M3: F1+F2+F3, F4, F5; M2: F1+F2+F3+F4, F5; M1: F1+F2+F3+F4+F5.

4.3.4 Reliability and validity analysis

When conducting reliability analysis, the sample data from CFA ($n = 412$) is used to analyze the reliability of various factors in the PP-Scale. According to the statistical results in Table 4.8, it can be seen that the Cronbach's $\alpha = 0.953$ in the scale, indicating that the scale has good reliability and measurement quality (Kline & Little, 2011; Os, 2001). According to Table 4.6, it can be seen that the Cronbach's α values of various dimensions in the PP-Scale are all above 0.800, indicating that the reliability of each dimension of the total scale is good. Among them, the Cronbach's α values of the cultivation and inheritance and the medical and social value of physician professionalism are all greater than 0.900, indicating a very high level of reliability (Kline & Little, 2011; Os, 2001).

Table 4.8 Internal consistency reliability of factors in the PP-Scale ($n = 412$)

Scale	Number of entries	Cronbach's α coefficient	Name of the factor	Number of entries	Cronbach's α coefficient
Physician professionalism scale (PP-Scale)	20	0.953	Basic norms	5	0.848
			New technologies and the application of new therapies	4	0.852
			Medical practice	4	0.837
			Cultivation and inheritance	4	0.906
			Medical and social value	3	0.924

In the validity analysis, the study considers three dimensions, content validity, convergent validity, and discriminant validity. When analyzing content validity, the study removed factors with factor loadings less than 0.500 or entries with overlapping factor loads from EFA. Due to the high retention criteria for entries set in this study, multiple rounds of deletion and optimization were performed on the entries of the scale after robust EFA. Meanwhile, the development of this scale followed the standard theoretical paradigm, and the entries of the initial scale were repeatedly considered, discussed, and optimized after sufficient literature and interview research, ensuring that the scale is of high content validity. When analyzing the convergent validity, the AVE values of each dimension in the scale ranged from 0.612 to 0.832, all exceeding the standard of 0.500. At the same time, according to the results of EFA and CFA, the standard factor loads of each dimension in this scale also exceeded 0.500, indicating that the PP-Scale has good convergent validity (Kline & Little, 2011; Os, 2001). When analyzing discriminant validity, the root mean square (RMS) values of AVE in each dimension of the PP-Scale were compared with the correlation coefficients between each dimension. The range of RMS values of AVE was between 0.818 and 0.946 (see Table 4.9), which were all greater than

the correlation coefficients of its row and column, indicating that the discriminant validity of this scale is good (Kline & Little, 2011; Os, 2001).

Table 4.9 Matrices and validity tests for each dimension of the PP-Scale (n = 412)

Dimension	F1	F2	F3	F4	F5
Basic norms (F1)	(0.818)				
New technologies and the application of new therapies (F2)	0.713	(0.853)			
Medical practice (F3)	0.689	0.714	(0.856)		
Cultivation and inheritance (F4)	0.706	0.728	0.763	(0.862)	
Medical and social value (F5)	0.684	0.723	0.752	0.829	(0.946)
AVE	0.612	0.648	0.716	0.762	0.832
CR	0.841	0.866	0.873	0.925	0.964

Note: The values in parentheses represent the square root of the average variable extracted (AVE) values for this latent variable.

4.4 Test of forecasting effectiveness by the PP-Scale

An important goal of conceptual development is to be able to explain or predict phenomena. The purpose of this study is to empirically test whether the PP-Scale can effectively predict physician professionalism. Through a review of existing research, this study explores the relationship between physician professionalism and physicians' occupational commitment (OC). Therefore, this study preliminarily examined the most fundamental research theme in the theoretical framework of physician professionalism, that is, whether creating a work atmosphere that stimulates compliance with physician professionalism in medical institutions will promote the improvement of the OC of individual physicians.

4.4.1 Theoretical background and research hypotheses

Based on the basic framework of the physician professionalism in the basic theory, enterprises' attention to physician professionalism will be conducive to achieving value-based healthcare, balancing short-term and long-term benefits, coping with future uncertainties, and improving the risk resistance capacity and the resilience of medical institutions and doctors when facing risks (X. Chen, 2013), further improving the overall efficiency of diagnosis and treatment activities, and resulting in sustainable healthcare (X. Chen, 2013). Therefore, the basic research topic is summarized as: "Will implementing physician professionalism in medical institutions improve physicians' OC level?". To be specific, it refers to whether more concerns on basic norms, new technologies, and the application of new therapies, medical practice, cultivation and inheritance, and medical and social values of physician professionalism in the diagnosis

and treatment of medical institutions will have a positive impact on physicians' OC. Adopting the developed PP-Scale to preliminarily verify the above issues, a hypothesis was proposed as follow:

Research hypothesis: The five dimensions of physician professionalism can have a positive impact on the improvement of occupational commitment level.

4.4.2 Test methods

The data for this study and the measurement of physician professionalism questionnaire were both from two grade A tertiary hospitals in Sanming City, Fujian Province. The questionnaire was also distributed and collected face-to-face, and a total of 824 valid samples were used for data analysis. The test subjects are employees at all levels of the hospital and are widely representative. After adopting the dimensions and items of the developed PP-Scale and conducting EFA and CFA, the reliability and validity of the scale are good. The 6-item scale modified by Zeng et al. (2019) was adopted in the OC scale. The specific items are: 1) Being a physician makes me pleasant; 2) I'm proud to work in the medical field; 3) I am happy to be a physician; 4) I identify with the profession of physician very much; 5) I am passionate about being a physician; 6) Being a physician is important to my self-image. The questionnaires were measured using a 5-point Likert scale, with evaluation ranging from "1 point for strongly disagree" to "5 points for strongly agree". Meanwhile, the scale will also include demographic information (age and gender) of the tested employees as control variables in the analysis.

4.4.3 Test results

This study conducted data analysis using SPSS 24. The CFA results of the PP-Scale showed a good degree of fitting. The reliability coefficient of the PP-Scale, Cronbach's $\alpha = 0.953$, and the Cronbach's α is 0.932 for the physician occupational commitment scale, indicating that the measurement scales for each variable have good reliability (Kline & Little, 2011; Os, 2001), and the descriptive statistics and analysis results for each variable are showed in Table 4.10.

Table 4.10. Descriptive analysis of variables

Variable	M	SD	1	2	3	4	5	6	7	8
1. Gender	1.443	0.48	1							
2. Age	30.52	5.12	-	1						
	0	6	0.159*							
3. Basic norms	4.052	0.66	0.043	0.054	1					
4. New	3.986	0.58	0.006	0.056	0.076*	1				

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Variable	M	SD	1	2	3	4	5	6	7	8
technologies and the application of new therapies		4			*					
5. Medical practice	4.223	0.698	0.005	0.063	0.068*	0.664*	1			
6. Cultivation and inheritance	4.167	0.654	0.012	0.066	0.069*	0.653*	0.713*	1		
7. Medical and social value	3.978	0.489	0.014	0.058	0.071*	0.648*	0.676*	0.723*	1	
8. Physician occupational commitment	4.116	0.547	0.158*	0.023	0.226*	0.224*	0.302*	0.267*	0.302*	1

Note: β = standardized beta coefficient; ** $P < 0.01$; * $P < 0.05$

Table 4.11 Regression model analysis of various dimensions of physician professionalism on physicians' occupational commitment

Variable	Physicians' occupational commitment				
	M1 β (SE)	M2 β (SE)	M3 β (SE)	M4 β (SE)	M5 β (SE)
Gender	-0.148**	-0.146**	-0.139**	-0.140**	-0.135**
Age	-0.012	-0.008	-0.006	-0.007	-0.005
Basic norms	0.267**				
New technologies and the application of new therapies		0.302**			
Medical practice			0.276**		
Cultivation and inheritance				0.285**	
Medical and social value					0.312**
R ²	0.085	0.112	0.088	0.116	0.082
Adjusted R ²	0.081	0.108	0.084	0.112	0.078
ΔR^2	0.085	0.112	0.088	0.116	0.082
F	26.304**	32.335**	25.883**	30.122**	26.225**

Note: β = standardized beta coefficient; ** $P < 0.010$; * $P < 0.050$.

According to the regression analysis model results shown in Table 4.11, the five dimensions of physician professional behavior are: the basic norms ($\beta = 0.267$, $p < 0.010$), new technologies and the application of new therapies ($\beta = 0.302$, $p < 0.010$), medical practice ($\beta = 0.276$, $p < 0.010$), cultivation and inheritance ($\beta = 0.285$, $p < 0.010$), and medical and social value ($\beta = 0.312$, $p < 0.010$). Based on the results in Table 10, all dimensions of physician professionalism have a significant positive impact on their OC, and the F-values of each regression model reach

a significant level. The regression coefficients of each variable in the model with respect to the dependent variable are all positive and the regression coefficients are all positively significant. Therefore, the research hypothesis has been validated on all dimensions of the PP-Scale.

Chapter 5: Quantitative Analysis of the Impact of Hospital Performance-based Pay Satisfaction on Physician Professionalism

5.1 Analysis method

5.1.1 Model construction

Pay satisfaction refers to employees' overall feelings after comparing the compensation they receive with their own expectations (Davlyatov et al., 2021). It is also a crucial component of job satisfaction. Research by Heneman and Schwab (1985) demonstrates that pay satisfaction significantly influences employee attitudes, behaviors, and performance, playing a vital role in decisions such as employee turnover and job intentions. Additionally, the comprehensive incentive theory model by Locke and Latham (2011) positions pay satisfaction as a key process linking employee work motivation and behavior. Studies suggest that employees' attitudes towards compensation play a moderating role in the impact of pay on job outcomes (Dreher et al., 2010). Therefore, performance-based pay satisfaction can be considered a necessary but not sufficient condition for organizations to achieve their compensation system goals. Particularly noteworthy is that, compared to other job satisfaction factors (such as satisfaction with colleagues or organizational culture), performance-based pay satisfaction better controls the antecedents of pay satisfaction. Hence, it is more crucial than other job satisfaction factors (Moro Visconti & Morea, 2020).

The theoretical foundation of pay satisfaction lies in social justice theory and differential theory. Theoretical models of pay satisfaction include Adas' equity model (Freeman et al., 2020), He's (2013) differential model, and Heneman and Schwab's (1985) adjustment gap model. Evolving from a single dimension to multiple dimensions, He proposed that pay satisfaction comprises two dimensions: pay satisfaction and benefit satisfaction. Heneman and Schwab, on the other hand, suggested that pay satisfaction consists of four dimensions: pay level satisfaction, pay raise satisfaction, benefit satisfaction, and structural management satisfaction. They developed the Pay Satisfaction Questionnaire (PSQ), widely used for measuring pay satisfaction.

On the other hand, because physician professionalism is consistently a complex and multidimensional concept, researchers focus on different concepts within the frameworks of moral ethics, physician behavior, and professional identity. Moreover, these emphases vary with different cultural backgrounds and change over time. Currently, scholars worldwide have not put forth a clear definition of physician professionalism. Therefore, measuring and studying the professional spirit of clinical physicians remains challenging for clinicians, medical education researchers, and healthcare managers. Many studies have developed scales tailored to different study populations and conducted applied evaluations (Honghe et al., 2017; Li, 2017; Veloski et al., 2005). This study used a self-developed Physicians Professionalism Scale (PP-Scale), consisting of five dimensions (namely, basic norms, new technologies and the application of new therapies, medical practices, cultivation and inheritance, and medical and social values), to assess the professional spirit of clinical physicians. Relevant research indicates that this scale, after development and debugging, demonstrates good reliability and validity, making it suitable for use among Chinese clinical physicians.

In summary, guided by the three principles and ten responsibilities of professionalism outlined in A Physicians' Chapter, and drawing inspiration from domestic and international tools for investigating physician professionalism (Roland et al., 2011; Wu et al., 2019), the researchers refine each influencing variable under various dimensions affecting physician professionalism. A systematic study of the interactive and integrative effects was conducted to seek evidence-based support. Based on this, the research focuses on the development of the Physicians Professionalism Scale.

This study aims to achieve the following objectives: (1) Literature Review and Conceptual Integration: Collect and organize existing literature on physician professionalism. Conduct a systematic review to summarize core concepts and dimensions. Effectively identify and systematically integrate these concepts for analysis. (2) Identification and Integration of Influencing Factors and Theoretical Perspectives: Summarize various important factors influencing physician professionalism. Analyze theoretical perspectives from different viewpoints. Effectively differentiate and integrate these influencing factors and theories. Construct the core conceptual dimensions of physician professionalism. (3) Development of Measurement Instrument: Utilize interview and questionnaire methods to extract and integrate themes from five dimensions of physician professionalism (basic norms, new technologies and the application of new therapies, medical practices, cultivation and inheritance, medical and social values). Themes include improving service quality, enhancing professional capabilities, taking responsibility for sharing scientific knowledge, prioritizing patient interests, ensuring

duty accountability, fair distribution of limited medical resources, maintaining trust by resolving conflicts of interest, promoting shared medical decision-making, being honest with patients, and maintaining patient confidentiality. Develop a measurement instrument for physician professionalism. Implement exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) for reliability and validity testing. Design a measurement instrument that aligns with the national context, covering the basic norms, new technologies and the application of new therapies, medical practices, cultivation and inheritance, and medical and social values of physician professionalism. The ultimate goal is to create a comprehensive measurement instrument that encompasses the nine responsibilities from the Physicians' Declaration within the professional attitude items and the ten responsibilities from A Physicians' Chapter within the professional behavior items, covering both positive and negative aspects of behavior.

The study reveals that the marginal effects of performance-based pay satisfaction on physician professionalism are influenced by age, professional title, and years of experience. The research aims to systematically investigate the professional spirit and performance-based pay satisfaction of clinical physicians in tertiary hospitals in Fujian Province. Taking into account demographic characteristics and work status, the study explores the relationship between hospital performance-based pay satisfaction and physician professionalism. Subsequently, the research aims to propose policy recommendations. Building on qualitative research regarding the impact of hospital performance-based pay on physician professionalism, the study introduces a hypothetical model, as illustrated in Figure 5.1.

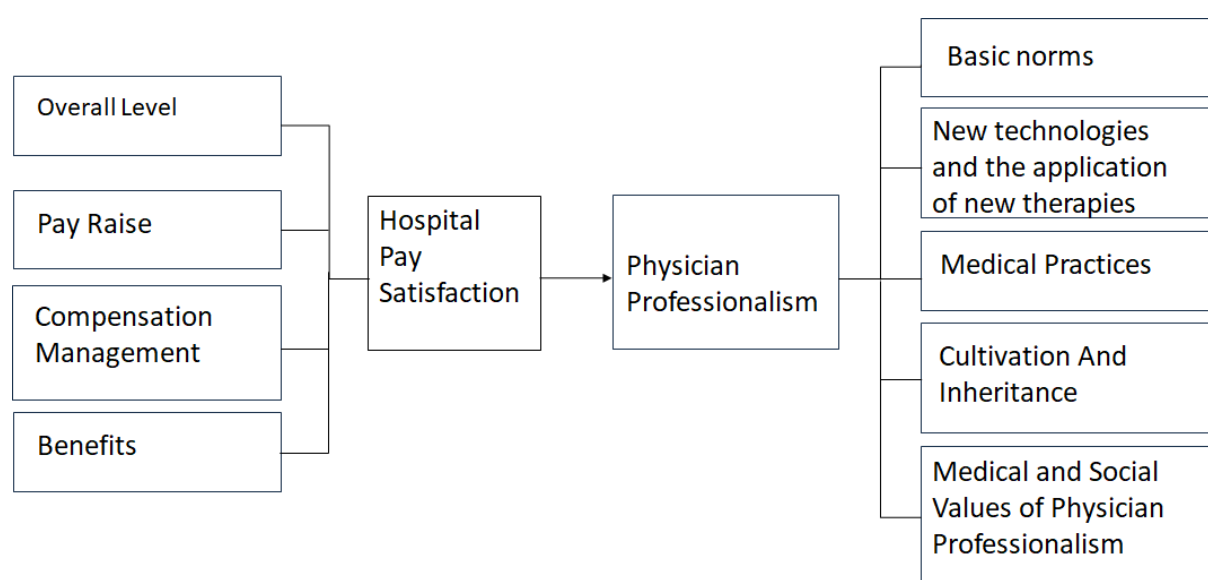


Figure 5.1 Hypothetical model of the impact of hospital performance-based pay on physician professionalism

4.1.2 Research hypotheses

Based on the definition of pay satisfaction (Hillier et al., 2020), the study infers that the satisfaction of clinical physicians with performance levels depends on two factors: first, the level of performance-based pay received, and second, the expectations regarding performance. In other words, higher professionalism indicates either higher received pay or lower expectations for performance. For clinical physicians with lower performance expectations, according to Goal Setting Theory (GST) in incentive theory, easily achievable goals are less likely to motivate them, diminishing the impact of incentives. For clinical physicians receiving higher performance-based pay, under the current performance-based pay system, this often implies a higher workload.

One aspect related to the definition of physician professionalism, such as “physician professional ethics and dedication,” can be explored through themes like honesty with patients and maintaining patient confidentiality. For instance, physicians with longer working hours are more likely to encounter patients who require honest disclosure of their medical condition. Although physicians may perceive that being completely honest with certain patient groups might lead to psychological distress or an inability to accept their true medical condition, choosing an appropriate time and method to truthfully inform patients and their families is essential. This approach can garner understanding and trust from patients and their families, reflecting the inherent aspects of physician professionalism and dedication. As physicians accumulate experiences with a growing number of patients, some special patient cases may indeed necessitate confidentiality about their medical condition. Adhering to such agreements demonstrates the physician’s commitment to professionalism and earns the trust of the patients involved.

Furthermore, in the new technologies and the application of new therapies dimension of physician professionalism, emphasizing modern values such as social responsibility, continuous learning, and the principle of patient-centric care, the higher the physician’s workload, the lower the average time spent per patient consultation. This results in reduced communication time with patients, diminishing the patients’ overall trust in seeking medical care. Research has shown that spending more time with patients positively influences patient trust in physicians (Neumann et al., 2011).

Additionally, in the medical practice dimension of physician professionalism, addressing responsibilities and fair allocation of limited healthcare resources, individual performance incentives may encourage competition and self-interest maintenance rather than adhering to

fairness. Studies indicate that a performance reward system for teams is more conducive to effective organizational functioning and collective physician engagement (Neumann et al., 2011). As healthcare services increasingly adopt team or treatment group formats, relying not only on individual work but also on team-based performance, it may better drive clinical physicians to assume responsibility and fairly allocate limited healthcare resources. Emphasizing respect for patients, a scientific attitude, and a sense of responsibility during diagnosis and treatment, team-based performance could be enhanced through team supervision, fostering a positive team environment, and ultimately elevating physician professionalism.

In the dimension of fostering and inheriting physician professionalism, the cultivation and inheritance of physician professionalism significantly enhance their professional spirit and strengthen their ability to integrate into clinical practice. Performance-related satisfaction also has a substantial positive impact on physician professionalism. This relationship may be attributed to the influence of economic incentives on altering doctors' behavioral motivations. The study hypothesizes that clinical physicians, if satisfied with their compensation, might attribute their behavior to the pursuit of reputation goals, especially behaviors with higher moral standards, such as pro-social behavior. When physicians receive satisfactory financial rewards, their intrinsic motivation may be displaced. Studies in behavioral economics suggest that monetary incentives can displace the intrinsic motivation of clinical physicians (Himmelstein et al., 2014). Performance-related compensation may have adverse effects on the motivation of clinical physicians in the medium and short term (Bidari et al., 2023). Research also indicates that performance systems may struggle to influence the strength of accountability mechanisms (Mayumana et al., 2017). Once negative non-professional behaviors related to “setting an example, passing on experience, and social publicity” do not receive timely feedback, the displacement of physicians' intrinsic motivation becomes more severe. Foreign studies also suggest that the use of powerful financial incentives often reduces physicians' intrinsic motivation to act in the best interest of patients (Mayumana et al., 2017).

In the dimension of medical and social values of physician professionalism, such as “improving the quality of medical services, enhancing professional skills, and establishing harmonious doctor-patient relationships,” the original intention of designing the performance-related compensation system establishes a positive relationship between compensation levels and employees' capacity improvement. This is achieved through a performance-related compensation system that implements a distribution system based on the principle of rewarding effort and skill, driving employees to continuously enhance their capabilities. In correspondence with the aspect of physician professionalism related to “improving the quality

of medical services and establishing harmonious doctor-patient relationships,” clinical physicians must engage in lifelong learning and have a responsibility to continually update their medical knowledge, clinical skills, and develop team spirit to ensure medical quality (Blank et al., 2003). On one hand, according to expectancy theory, the intensity of stimulus equals the product of expectancy and valence. The study speculates that the effectiveness of capacity improvement in the performance system may be insufficient. In other words, the rewards for capacity improvement in the performance system may be too low to generate effective stimulation. On the other hand, the existing performance-related compensation system may lack evaluation of physicians’ capabilities or timely and effective feedback.

Based on this, the study proposes the following hypotheses and will validate them through the performance-related satisfaction questionnaire and the developed Physicians Professionalism Scale.

Hypothesis: The various dimensions of hospital performance-related compensation satisfaction (overall level, structural management, pay raise, benefits) have an impact on the five dimensions of physician professionalism (basic norms, new technologies and the application of new therapies, medical practice, cultivation and inheritance, medical and social values).

Hypothesis: The association between hospital performance-related compensation satisfaction and physician professionalism is moderated by individual characteristics, performance-to-pay ratio, and work status.

5.1.3 Sampling method and research plan

To validate the structural validity and reliability of the Physicians Professionalism Scale, this study conducted a pilot survey. The participants in the pilot survey were clinical physicians from tertiary hospitals in Sanming City, Fujian Province. The sampling institutions were expected to be selected from two comprehensive hospitals in Sanming City, Fujian Province. The stratified random sampling (SRS) method was employed to verify the initial reliability and validity of the Physicians Professionalism Scale. Based on the preliminary literature review, demographic characteristics that could potentially influence physician professionalism scores were used as the stratification basis for this survey. To meet the requirements for reliability and validity testing of the scale, the sample size for a single scale should generally be at least 5 to 10 times the number of items on the scale. The performance-related satisfaction questionnaire in this study consists of 18 items, and the Physicians Professionalism Scale has 20 items. Therefore, the study anticipates selecting 160 clinical physicians to participate in the survey to

achieve the desired effect.

5.1.4 Statistical and analytical methods

In this research, the following statistical indicators were utilized:

(1) Cronbach's α Coefficient: The internal consistency of the developed Physicians Professionalism Scale was examined using Cronbach's α coefficient. The Cronbach's α coefficient primarily calculates the average of the split-half reliability of all possible item divisions in the scale. Ranging from 0 to 1, a Cronbach's α coefficient value exceeding 0.700 indicates reasonable reliability, and a value surpassing 0.800 indicates very good reliability. We computed the Cronbach's α coefficient for all items in the developed Physicians Professionalism Scale, and the values for each sub-dimension exceeded 0.800, demonstrating good reliability.

(2) Kaiser-Meyer-Olkin (KMO) Test: The KMO test, comparing simple correlations and partial correlations among variables, yielded values ranging from 0 to 1. A KMO value above 0.500 suggests suitability for factor analysis, and a value exceeding 0.700 indicates a good fit for factor analysis.

(3) Bartlett Spherical Test: The Bartlett spherical test, assessing the independence of variables, produces a p-value. A p-value less than 0.050 indicates statistical significance, rejecting the hypothesis of zero correlation and confirming the presence of interrelated variables and sufficient common variance.

(4) Confirmatory Factor Analysis (CFA): CFA was employed to assess the structural validity of the developed Physicians Professionalism Scale. This statistical method utilizes Maximum Likelihood Estimation (MLE) to evaluate the sample data measured by scale items (observed variables). CFA is employed to verify whether the theoretical model of the scale holds statistically, thus examining the structural validity of the scale.

(5) Criteria for CFA Model Fit: The selected CFA model fit in this study was evaluated based on several fit indices: ① Chi-square value (χ^2): Chi-square value is a commonly used fit index, indicating the probability of correctness in conjunction with degrees of freedom (df). The ratio χ^2/df is employed to directly assess the similarity between the estimated covariance matrix and the sample covariance matrix. A lower χ^2/df ratio closer to 1 suggests a better model fit. Typically, a ratio close to 2 is considered good fit. However, with large sample sizes, a χ^2 increase may introduce the possibility of type I errors. In practical terms, a χ^2 value around 5.0 is considered acceptable for a sample size of 500, but it should be evaluated in conjunction with

other fit indices. ② Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI): CFI and TLI are comparative fit indices that compare the hypothesized model to an independent model. Both indices range from 0 to 1, with values closer to 1 indicating better fit. A CFI and TLI value greater than or equal to 0.900 is generally considered indicative of a well-fitted model. ③ Root-Mean-Square Error of Approximation (RMSEA): RMSEA evaluates the lack of fit in the model. Lower RMSEA values closer to 0 indicate a better model fit. Typically, a well-fitted model has a RMSEA less than or equal to 0.050, a reasonably fitted model has a RMSEA less than or equal to 0.080, and a RMSEA greater than 0.100 suggests poor fit.

Based on the analysis results mentioned above, the survey instrument will be further refined and adjusted to better align with the characteristics of the participants. This refinement aims to create the final version of the survey questionnaire, taking into consideration the specific traits of the subjects. Additionally, modifications will be made to certain words and phrases for the purpose of enhancing readability and comprehension.

5.2 Research tools

5.2.1 Pay for performance satisfaction questionnaire

The Pay for Performance Satisfaction Questionnaire (PFPSQ) is adapted from the Pay Satisfaction Questionnaire (PSQ) developed by Heneman et al. (1985), with modifications by Jin (2019). The PFPSQ demonstrates a Cronbach's α coefficient of 0.980, RMSEA of 0.070, CFI of 0.980, TLI of 0.980, and KMO values exceeding 0.800. The Bartlett's spherical test yielded a p-value less than 0.010 (Jin, 2019). This questionnaire comprises four dimensions: Overall Satisfaction (items 1-4), Pay Raise (items 5-8), Compensation Management (items 9-12), and Benefits (items 13-18), totaling 18 items. Each item is rated on a 5-point Likert scale, ranging from very dissatisfied to very satisfied, with scores assigned as follows: 1 for very dissatisfied, 2 for dissatisfied, 3 for neutral, 4 for satisfied, and 5 for very satisfied (see Table 5.1 for item details).

Table 5.1 Hospital compensation satisfaction dimension breakdown

Dimension	Item
Overall Level	1. Your overall satisfaction with your current income level.
	2. Your satisfaction with your after-tax income.
	3. Your satisfaction with the total amount of your current performance-based pay.
	4. Your satisfaction with the number of items in your current performance-based pay.
	5. Your satisfaction with the benefits you receive.

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Dimension	Item
Pay Raise	6. Your satisfaction with the composition of hospital benefits. 7. Your satisfaction with the perceived value of the benefits you receive. 8. Your satisfaction with the number of benefit items you receive. 9. Your satisfaction with the average number of pay increases you have received in the past.
Compensation Management	10. Your satisfaction with your most recent increase in performance-based pay. 11. Your satisfaction with the policies governing decisions about your raises. 12. The impact of superiors on your raise decisions makes you feel. 13. Your satisfaction with the hospital's compensation policy system.
Benefits	14. Your satisfaction with the transparency of compensation information in the hospital. 15. Your satisfaction with compensation for other positions in the hospital. 16. Your satisfaction with the fairness of the hospital's compensation policies. 17. Your satisfaction with the compensation differences across different positions in the hospital. 18. Your satisfaction with the hospital's compensation management.

5.2.2 Physician professionalism scale

The Physician Professionalism Scale (PP-Scale) employed in this study is a newly developed tool to assess physician professionalism. The scale exhibits a Cronbach's α coefficient of 0.953, SRMR of 0.036, RMSEA of 0.071, CFI of 0.952, TLI of 0.945, KMO values exceeding 0.800, and a Bartlett spherical test yielding a p-value below 0.010. As shown in Table 5.2, the scale comprises five dimensions, encompassing the basic norms of physician professionalism (items 1-5), the new technologies and the application of new therapies of physician professionalism (items 6-9), the medical practices associated with physician professionalism (items 10-13), the cultivation and inheritance of physician professionalism (items 14-17), and the medical and societal values associated with physician professionalism (items 18-20). In total, the scale includes 20 items (referring to Table 16 for item details). Respondents rate each item on a Likert scale ranging from 1 (very dissatisfied) to 5 (very satisfied).

Table 5.2 Physician Professionalism Scale

Dimension	Item
Basic norms of Physician Professionalism	1. Fully inform patients about the benefits, risks, and alternatives of treatment.
	2. Be truthful and not mislead patients into making unreasonable medical choices.
	3. Maintain confidentiality regarding patients' medical conditions and personal privacy.
	4. Prioritize the interests of patients over the personal interests of the physician.
	5. Provide basic medical emergency services regardless of the patient's ability to pay.
New technologies and the application of new therapies of Physician Professionalism	6. Adherence to clinical guidelines and medication protocols for rational examination, treatment, and medication.
	7. Physicians should regularly update their knowledge and skills, continuously improving their professional competence.
	8. Use critical thinking to learn or apply new knowledge and technologies.
	9. Integrate traditional and new therapies to provide valuable diagnostic and treatment services.
Medical Practices of Physician Professionalism	10. Physicians should dedicate themselves to improving the quality of medical care.
	11. Physicians should participate in evaluating the medical quality of their colleagues.
	12. Physicians should voluntarily report any adverse medical events they experience.
	13. Physicians should report clearly incompetent colleagues to superiors or relevant authorities.
Cultivation and Inheritance of Physician Professionalism	14. Disseminate health knowledge to society in an understandable manner.
	15. Fairly and objectively evaluate colleagues' professional competence and personal qualities.
	16. Avoid mutual defamation or unfair practices that undermine patients' trust in other colleagues.
	17. When facing technical limitations, consult with colleagues or seek help to obtain a reasonable diagnosis and treatment plan.
Medical and Societal Values of Physician Professionalism	18. In medical services, treat patients equally regardless of their wealth, status, gender, and ethnicity.
	19. For patients with financial difficulties, physicians should try to choose cost-effective treatment options.
	20. Provide comprehensive medical services and health guidance for patients.

5.2.3 Self-designed items

Self-designed items consist of three parts (basic demographic characteristics, work-related conditions related to physician professionalism, and the performance-to-pay ratio). Basic demographic characteristics include age, gender, years of work, department, and professional title level; work-related conditions related to physician professionalism include daily sleep

duration, monthly overtime frequency, monthly night shift frequency, and other items; the current status of performance-based income distribution includes items related to the proportion of performance-based income to total compensation.

5.3 Research results

5.3.1 Descriptive statistics

In the study examining the impact of hospital performance-based compensation on physician professionalism, this research incorporates demographic characteristics, work-related conditions related to physician professionalism, and the performance-to-pay ratio into the data collection scope. Adjusted effect tests were conducted using these variables. The survey targeted physicians from two tertiary hospitals in Sanming City, Fujian Province, conducting face-to-face paper questionnaire collection. A total of 180 questionnaires were distributed, with 160 valid responses obtained, resulting in an 88.89% response rate. The statistical analysis using Excel revealed that demographic characteristics included information on gender, age, professional title, years of work, department, while the performance-to-pay ratio and work-related conditions included variables such as daily sleep duration, monthly overtime frequency, and monthly night shift frequency. The summarized demographic information of the surveyed participants is presented in Table 5.3.

Table 5.3 Basic information of the sample (N=160)

Category	Variable	Group	Count	Performance Satisfaction
Demographics	Gender	Male	86	56.98%
		Female	74	67.57%
	Age	30 and below	46	67.39%
		31-40	51	43.14%
		41-50	52	57.69%
		51-60	8	75.00%
		61 and above	3	100.00%
	Professional Title	Junior	41	43.90%
		Intermediate	62	64.52%
		Associate Senior	40	77.50%
		Senior	17	88.24%
	Years of Work	Less than 5 years	35	40.00%
		6-15 years	55	56.36%
		16-25 years	40	62.50%
		26-35 years	20	80.00%
		36 years and above	10	90.00%
	Department	Internal Medicine	29	55.17%
		Surgery	32	56.25%
		Obstetrics and	27	44.44%

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Category	Variable		Group	Count	Performance Satisfaction
Performance-to-Pay Ratio	Ratio		Gynecology		
			Pediatrics	31	45.16%
			Emergency Department	41	39.02%
			Less than 20%	20	35.00%
			20%-50%	61	45.90%
			51%-60%	15	60.00%
			61%-80%	36	47.22%
Work Status	Daily Sleep Duration		81% and above	28	42.86%
			Below 6 hours	82	42.68%
			6-8 hours	60	65.00%
			8 hours and above	18	72.22%
			2 days or less	115	60.87%
	Monthly Overtime Frequency	Night Shift	2-3 days	34	44.12%
			3 days or more	11	36.36%
			2 times or less	78	57.69%
			2-3 times	61	45.90%
			3 times or more	21	38.09%

According to the statistical results, a gender-based analysis reveals that females exhibit higher performance satisfaction with their compensation compared to males. Regarding age distribution, satisfaction follows a U-shaped trend, with the lowest performance satisfaction observed between the ages of 31 and 40; as age increases, satisfaction demonstrates a notable upward trend. In terms of professional titles, higher titles correspond to increased performance satisfaction. Work experience shows a positive correlation with performance satisfaction, indicating that longer work experience is associated with higher satisfaction. Looking at departmental distribution, physicians in the Emergency Department express the lowest performance satisfaction, possibly influenced by night shifts or overtime. Examining performance-to-pay ratios, physicians in the 51%-60% range exhibit the highest satisfaction, emphasizing the importance of setting reasonable performance-to-pay ratios. Analyzing work status, performance satisfaction correlates positively with daily sleep duration and negatively with monthly overtime and night shift frequency, highlighting the significance of adequate rest in enhancing physicians' performance satisfaction.

5.3.2 Reliability and validity analysis of measurement scales

5.3.2.1 Reliability analysis

Reliability analysis of all questionnaire items was conducted using the statistical software SPSS 24.0, and the summarized results are presented in Table 5.4. The overall Cronbach's α coefficients for the two variables in this study were both above 0.800, indicating good reliability for the entire scales. Additionally, the α coefficients for individual dimensions within each

variable were all above 0.700, further affirming the satisfactory reliability of each questionnaire.

Table 5.4 Consistency coefficients for each variable and dimension

Variable	Dimension	Alpha Coefficient for Each Dimension	Alpha Coefficient for the Entire Scale
Hospital Performance Satisfaction	Overall Level	0.862	0.978
	Pay Raise	0.922	
	Pay Compensation	0.931	
	Management	0.912	
	Benefits	0.862	
Physician Professionalism	Basic norms	0.862	0.906
	New technologies and the application of new therapies	0.903	
	Medical Practice	0.886	
	Cultivation and Inheritance	0.892	
	Medical and Social Values	0.894	

5.3.2.2 Validity analysis

For the Hospital Performance Pay Satisfaction questionnaire, an exploratory factor analysis was conducted on the 18 items. The Kaiser-Meyer-Olkin (KMO) measure exceeded 0.700, and Bartlett's spherical test yielded a significance level below 0.010, meeting the conditions for factor analysis. The study employed principal component extraction of factors with eigenvalues greater than 1 and rotated them through maximum variance rotation. Four factors were extracted: Overall Level, Pay Raise, Compensation Management, and Benefits. The cumulative variance contribution rate reached 71.023%, and all factor loadings were above 0.700, as shown in Table 5.3. These results indicate that the variable possesses good structural validity.

For the Physician Professionalism Scale, an exploratory factor analysis was conducted on the 20 items. The KMO value exceeded 0.700, and Bartlett's spherical test yielded a significance level below 0.010, meeting the conditions for factor analysis. The study employed principal component extraction of factors with eigenvalues greater than 1 and rotated them through maximum variance rotation. Five factors were extracted: basic norms, new technologies and the application of new therapies, Medical Practice, Cultivation and Inheritance, and Medical and Social Values. The cumulative variance contribution rate reached 79.010%, and all factor loadings were above 0.650, as shown in Table 5.5. These results indicate that the variable possesses good structural validity.

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Table 5.5 Factor loadings for each variable and dimension

Scale	Number of Items	KMO Value	P Value	Extracted Factors	Number of Extracted Factors	Cumulative Variance Contribution Rate	Significant Factor Loadings
Hospital Performance Pay Satisfaction	18	>0.700	<0.010	Overall Level, Pay Raise, Compensation Management, Benefits	4	71.023%	>0.700
Physician Professionalism	20	>0.700	<0.010	Basic norms, new technologies and the application of new therapies, Medical Practice, Cultivation and Inheritance, Medical and Social Values	5	79.010%	>0.650

5.3.3 Multiple linear regression analysis results

To further analyze the impact of performance-related compensation satisfaction on the professional well-being of physicians and assess the robustness of the model, a regression model was established, controlling for various factors based on a review of the literature. Demographic variables included in the model are gender, age, education level, professional title, years of work experience, and department. Work-related variables encompass daily average sleep duration, monthly night shifts, monthly overtime hours, and performance-related variables (performance-to-compensation ratio), as illustrated in Table 5.6.

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Table 5.6 Controlled variables for regression models 1-4

Category	Variable	Value Assignment	Model 1	Model 2	Model 3	Model 4
Demographics	Gender	Male (Reference) = 1, Female = 2	Yes	Yes	Yes	Yes
	Age	<=30 years (Reference) = 1, 31-40 years = 2, 41-50 years = 3, 51-60 years = 4, >=61 years = 5	Yes	Yes	Yes	Yes
	Education Level	Ph.D. (Reference) = 1, Master's = 2, Bachelor's = 3, Diploma or below = 4	Yes	Yes	Yes	Yes
	Title	Junior (Reference) = 1, Intermediate = 2, Associate Senior = 3, Senior = 4		Yes	Yes	Yes
	Work Experience	<=5 years (Reference) = 1, 6-15 years = 2, 16-25 years = 3, 26-35 years = 4, >=36 years = 5		Yes	Yes	Yes
	Department	Internal Medicine (Reference) = 1, Surgery = 2, Obstetrics and Gynecology = 3, Pediatrics = 4, Emergency Medicine = 5			Yes	Yes
Performance Pay Ratio	Performance Pay Ratio	<=20% = 1, 20-50% = 2, 51-60% (Reference) = 3, 61-80% = 4, >=81% = 5			Yes	Yes
Work Status	Monthly Overtime Frequency	<=2 times (Reference) = 1, 2-3 times = 2, 3 times or more = 3				Yes

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Category	Variable	Value Assignment	Model 1	Model 2	Model 3	Model 4
	Monthly Night Shift Frequency	<=2 times (Reference) = 1, 2-3 times = 2, 3 times or more = 3				Yes
	Daily Sleep Duration	<6 hours (Reference) = 1, 6-8 hours = 2, >=8 hours = 3				Yes

5.3.3.1 Assessing the influence of performance pay satisfaction on physician professionalism

In the initial analysis, a multiple linear regression was conducted with physician professionalism as the dependent variable and performance pay satisfaction as the independent variable. The objective was to explore the relationship between performance pay satisfaction and physician professionalism across different models. The summarized results are presented in Table 5.7.

Table 5.7 Multiple linear regression analysis results of performance pay satisfaction on physician professionalism scores

Variable	Group	Model 1	Model 2	Model 3	Model 4
Performance Pay Satisfaction		0.152* (0.045)	0.151* (0.045)	0.154* (0.045)	0.156* (0.045)
Education Level	Reference: Ph.D. Master's	0.173 (0.110)	0.202* (0.110)	0.212* (0.110)	0.255* (0.112)
	Bachelor's	0.212 (0.112)	0.281* (0.112)	0.293* (0.153)	0.326* (0.153)
	Diploma or below	0.442 (0.361)	0.593 (0.373)	0.594 (0.385)	0.586 (0.382)
Performance Pay Ratio	Reference:51-60% <=20%			-0.061 (0.183)	-0.042 (0.183)
	21-50%			-0.110 (0.142)	-0.110 (0.142)
	61-80%			-0.463* (0.165)	-0.482* (0.165)
	>=81%			-0.152 (0.193)	-0.196 (0.193)
Constant		-0.232 (0.133)	-0.286* (0.133)	-0.207 (0.205)	-0.094 (0.424)
Adj-R ²		0.032	0.046	0.075	0.106

Note: *P<0.050

The regression equations in models 1 to 4 explain 3.200%, 4.600%, 7.500%, and 10.600% of the variance in physician professionalism scores, respectively. Controlling for demographic

variables (gender, age, title, work experience, and department), work-related factors (daily sleep duration, monthly overtime frequency, and monthly night shifts), and performance pay ratio, performance pay satisfaction significantly influences physician professionalism scores ($P < 0.050$) in models 1 to 4. In model 4, when controlling for other variables, a one-standard deviation increase in performance pay satisfaction is associated with a 0.183 standard deviation increase in physician professionalism scores. In models 2 to 4, significant differences in physician professionalism scores exist among different education levels ($P < 0.050$). Compared to the doctoral group, physicians with master's and bachelor's degrees exhibit higher professionalism scores. In model 4, when controlling for other variables, physicians with master's and bachelor's degrees score 0.255 and 0.326 standard deviations higher than those with doctoral degrees, and the differences are significant. Models 3 and 4 reveal significant differences in physician professionalism scores among different performance pay ratios. Compared to the 51%-60% performance pay ratio group, both the <20% and 21%-50% groups have negative coefficients, with the 61%-80% group's coefficient being significantly negative. This suggests a significantly lower level of physician professionalism in this group. The empirical results indicate that the regression results in model 4 are consistent with models 1 to 3. Performance pays satisfaction's impact on physician professionalism remains significant across different classification criteria, demonstrating the robustness of model 4. The effect does not vary with changes in demographic, work-related, and performance pay ratio variables, reinforcing the model's stability.

5.3.3.2 Impact of performance pay satisfaction dimensions on physician professionalism

In line with the salary satisfaction scale revised by Henenman et al. (1985) and the Physician Professionalism scale developed in this study, the study aimed to explore the relationship between the four dimensions of performance pay satisfaction, namely "Level," "Benefits," "Pay Raise," and "Compensation Management," and physician professionalism. To achieve this, multiple linear regression analyses were conducted for each dimension, separately, with physician professionalism and its five facets, namely "basic norms of Physician Professionalism," "new technologies and the application of new therapies of Physician Professionalism," "Medical Practice in Physician Professionalism," "Cultivation and Inheritance of Physician Professionalism," and "Medical and Social Value in Physician Professionalism."

The analyses were carried out across four models (Model 1 to Model 4) to comprehensively assess the impact of each dimension of performance pay satisfaction on both overall physician

professionalism and its distinct facets. This approach allows for a nuanced understanding of how different aspects of performance pay satisfaction contribute to the multifaceted nature of physician professionalism.

Table 5.8 Regression analysis results for performance pay satisfaction dimensions on physician professionalism

Variable	Dimension	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Performance Pay Satisfaction	Level	-0.212* (0.084)	-0.212* (0.084)	-0.234* (0.084)	-0.213* (0.084)
	Benefits	0.062 (0.085)	0.073 (0.085)	0.123 (0.085)	0.133 (0.085)
	Pay Raise	0.100 (0.100)	0.100 (0.112)	0.062 (0.112)	0.052 (0.112)
	Compensation	0.205* (0.096)	0.193* (0.096)	0.224* (0.096)	0.245* (0.096)
	Management				

Note: *P<0.050

As is shown in Table 5.8, across all models (models 1 to 4), the “Level” dimension of performance pay satisfaction has a consistently negative impact on physician professionalism (β = -0.212, -0.212, -0.234, and -0.213), and all are statistically significant (P<0.050). The “Compensation Management” dimension consistently has a significant positive impact on physician professionalism (β = 0.205, 0.193, 0.224, 0.245). The “Benefits” and “Pay Raise” dimensions have positive impacts on physician professionalism, but the effects are not statistically significant.

5.3.3.4 Impact of performance pay satisfaction dimensions on the first dimension of physician professionalism

The regression analysis results for the impact of each dimension of performance pay satisfaction on the first dimension of physician professionalism, “Physician Professionalism’s basic norms,” are presented in Table 5.9.

Table 5.9 Regression analysis results for performance pay satisfaction dimensions on physician professionalism’s definition

Variable	Dimension	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Performance Pay Satisfaction	Level	-0.263* (0.083)	-0.253* (0.083)	-0.274* (0.083)	-0.265* (0.083)
	Benefits	-0.021* (0.083)	-0.014* (0.083)	0.033 (0.083)	0.021 (0.083)
	Pay Raise	0.172 (0.102)	0.172 (0.102)	0.156 (0.113)	0.143 (0.113)
	Compensation	0.233* (0.092)	0.224* (0.092)	0.253* (0.092)	0.284* (0.092)
	Management				

Note: *P<0.050

As shown in Table 5.9, the “Level” and “Compensation Management” dimensions of performance pay satisfaction significantly influence the first dimension of physician professionalism, “Physician Professionalism’s basic norms.” In Model 4, when controlling for other variables, for each additional standard deviation in “Level” ($\beta=-0.263$), “Physician Professionalism’s basic norms” decreases by 0.263 standard deviations. For each additional standard deviation in “Compensation Management” ($\beta=0.284$), “Physician Professionalism’s basic norms” increases by 0.284 standard deviations. “Benefits” and “Pay Raise” have positive impacts on “Physician Professionalism’s basic norms,” but the effects are not statistically significant.

5.3.3.5 Impact of performance pay satisfaction dimensions on the second dimension of physician professionalism

The regression analysis results for the impact of each dimension of performance pay satisfaction on the second dimension of physician professionalism, “Physician Professionalism’s new technologies and the application of new therapies,” are presented in Table 5.10.

Table 5.10 Regression analysis results for performance pay satisfaction dimensions on physician professionalism’s historical development

Variable	Dimension	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Performance Pay Satisfaction	Level	-0.253* (0.084)	-0.253* (0.084)	-0.253* (0.084)	-0.236* (0.084)
	Benefits	0.022 (0.083)	0.034 (0.083)	0.073 (0.083)	0.086 (0.083)
	Pay Raise	0.154 (0.102)	0.154 (0.114)	0.112 (0.114)	0.106 (0.114)
	Compensation Management	0.164 (0.092)	0.164 (0.092)	0.182 (0.092)	0.182 (0.092)

Note: *P<0.050

As shown in Table 5.10, the “Level” dimension of performance pay satisfaction has a significant negative impact on “Physician Professionalism’s new technologies and the application of new therapies.” In Model 4, when controlling for other variables, for each additional standard deviation in “Level” ($\beta=-0.236$), “Physician Professionalism’s new technologies and the application of new therapies” decreases by 0.236 standard deviations. “Benefits,” “Pay Raise,” and “Compensation Management” have positive impacts, but the effects are not statistically significant.

5.3.3.6 Impact of performance pay satisfaction dimensions on the third dimension of physician professionalism

The regression analysis results for the impact of each dimension of performance pay satisfaction on the third dimension of physician professionalism, “Physician Professionalism’s Medical Practice,” are presented in Table 5.11.

Table 5.11 Regression analysis results for performance pay satisfaction dimensions on physician professionalism’s medical practice

Variable	Dimension	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Pay Performance Satisfaction	Level	-0.123 (0.082)	-0.123 (0.082)	-0.142 (0.082)	-0.112 (0.082)
	Benefits	0.122 (0.083)	0.142 (0.083)	0.193* (0.083)	0.204* (0.083)
	Pay Raise	0.000 (0.102)	-0.012 (0.112)	-0.052 (0.113)	-0.073 (0.111)
	Compensation	0.174	0.163	0.182	0.194*
	Management	(0.094)	(0.094)	(0.094)	(0.094)

Note: *P<0.050

As shown in Table 5.11, in Model 3, the “Benefits” dimension of performance pay satisfaction significantly impacts “Physician Professionalism’s Medical Practice” (P<0.050). In Model 4, both the “Benefits” and “Compensation Management” dimensions have significant impacts (P<0.050). In Model 4, when controlling for other variables, for each additional standard deviation in “Benefits” ($\beta=0.204$), “Physician Professionalism’s Medical Practice” increases by 0.204 standard deviations. The “Compensation Management” dimension ($\beta=0.194$) shows that for each additional standard deviation, “Physician Professionalism’s Medical Practice” increases by 0.194 standard deviations. The “Level” and “Pay Raise” dimensions have negative impacts, but they are not statistically significant.

5.3.3.7 Impact of performance pay satisfaction dimensions on the fourth dimension of physician professionalism

The regression analysis results for the impact of each dimension of performance pay satisfaction on the fourth dimension of physician professionalism, “Physician Professionalism’s Cultivation and Inheritance,” are presented in Table 5.12.

Table 5.12 Regression analysis results for performance pay satisfaction dimensions on physician professionalism's cultivation and inheritance

Variable	Dimension	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Pay Performance Satisfaction	Level	-0.113 (0.084)	-0.113 (0.084)	-0.132 (0.084)	-0.123 (0.084)
	Benefits	0.103 (0.082)	0.112 (0.082)	0.174* (0.082)	0.173* (0.082)
	Pay Raise	0.000 (0.102)	-0.012 (0.112)	-0.054 (0.112)	-0.073 (0.112)
	Compensation	0.163 (0.092)	0.154 (0.092)	0.193* (0.092)	0.204* (0.092)
	Management				

Note: *P<0.050

As depicted in Table 5.12, the impact of the “Benefits” and “Compensation Management” dimensions of performance pay satisfaction on the fourth dimension of physician professionalism, “Physician Professionalism’s Cultivation and Inheritance,” is statistically significant in both Model 3 and Model 4 (P<0.050). In Model 4, while controlling for other variables, an increase of one standard deviation in the “Benefits” dimension ($\beta=0.173$) is associated with a corresponding increase of 0.173 standard deviations in “Physician Professionalism’s Cultivation and Inheritance.” Similarly, for the “Compensation Management” dimension ($\beta=0.204$), each additional standard deviation corresponds to an increase of 0.204 standard deviations in “Physician Professionalism’s Cultivation and Inheritance.” However, the dimensions of “Level” and “Pay Raise” exhibit negative impacts on “Physician Professionalism’s Cultivation and Inheritance,” but these effects are not statistically significant.

5.3.8.8 Regression analysis results: impact of four dimensions of performance pay satisfaction on physician professionalism - medical and social value

The following table (Table 5.13) presents the regression analysis results for the influence of the four dimensions of performance pay satisfaction on the fourth dimension of physician professionalism, specifically “Medical and Social Value.”

Table 5.13 Regression analysis results for performance pay satisfaction dimensions on physician professionalism - medical and social value

Variable	Dimension	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Pay Performance Satisfaction	Level	-0.112 (0.083)	-0.112 (0.083)	-0.131 (0.083)	-0.122 (0.083)
	Benefits	0.102 (0.082)	0.112 (0.082)	0.173* (0.082)	0.173* (0.082)
	Pay Raise	0.001 (0.102)	-0.012 (0.112)	-0.053 (0.112)	-0.073 (0.112)
	Compensation	0.163 (0.092)	0.154 (0.092)	0.192* (0.092)	0.201* (0.092)

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Variable	Dimension	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
	Management	(0.093)	(0.093)	(0.093)	(0.093)

As shown in Table 5.13, both in Model 3 and Model 4, the dimensions “Benefits” and “Compensation Management” of performance pay satisfaction significantly impact the fifth dimension of physician professionalism, “Physician Professionalism’s Medical and Social Value” ($P < 0.050$). In Model 4, when controlling for other variables, an increase of one standard deviation in the “Benefits” dimension ($\beta = 0.173$) is associated with a corresponding increase of 0.173 standard deviations in “Physician Professionalism’s Medical and Social Value.” Similarly, for the “Compensation Management” dimension ($\beta = 0.201$), each additional standard deviation corresponds to an increase of 0.201 standard deviations in “Physician Professionalism’s Medical and Social Value.” However, the dimensions of “Level” and “Pay Raise” exhibit negligible and statistically insignificant impacts on “Physician Professionalism’s Medical and Social Value.”

5.3.4 Moderation effect testing

To examine whether the marginal effects of the relationship between performance pay satisfaction and physician professionalism are moderated by certain variables, the study followed Hayes’ (2013) recommendations.

For a more comprehensive understanding of the regression equation, the research first standardized the variables of physician professionalism and performance pay satisfaction. Subsequently, various interaction terms were computed, encompassing demographic variables (gender, age, education level, title, work experience, and department), work-related variables (monthly overtime frequency, monthly night shifts, daily sleep hours), and the interaction terms between performance pay and these variables (Models 4-1 to 4-10), as shown in Table 5.14.

Table 5.14 Analysis table for moderating effects of demographic, work-related, and performance pay variables

Number	Interaction Term	R^2	R^2 Change	Main Effect Significant	Interaction Effect Significant
Model 4-1	Gender	0.100	0.000		
Model 4-2	Age Group	0.101	0.072		*
Model 4-3	Education Level	0.102	0.000	*	
Model 4-4	Title	0.100	0.083		*
Model 4-5	Work Experience	0.121	0.201		*
Model 4-6	Department	0.100	0.000		

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Number	Interaction Term	R ²	R ² Change	Main Effect Significant	Interaction Effect Significant
Model 4-7	Performance Pay Ratio	0.100	0.112	*	
Model 4-8	Monthly Overtime Frequency	0.100	0.000		
Model 4-9	Monthly Night Shift Frequency	0.110	0.111	*	*
Model 4-10	Daily Sleep Hours	0.100	0.000		

Note: *P<0.050

The moderation effect results of each variable are shown in the table above (Table 5.14). The regression coefficients of the interaction terms of age, title, work experience, and the monthly night shift frequency are significant (Models 4-2, 4-4, 4-5, 4-7, 4-9). This indicates that the marginal effects of performance pay satisfaction on physician professionalism are significantly influenced by these variables. The R² changes are 0.072, 0.083, 0.201, 0.112, and 0.111, respectively, with work experience showing a relatively large R² change.

The regression results for the interaction models with various moderators, including age, title, work experience, performance pay ratio, and monthly night shifts, are presented in Annex F Table f.1.

As shown in Table f.1, in Model 4-2, the marginal effect of performance pay satisfaction on physician professionalism is moderated by age. In comparison to the age group of 30 and below, the impact diminishes for other age groups (-0.122, -0.273, -0.144, -0.164).

Notably, there is a significant difference in the age group of 41-50 years, indicating that for doctors in this age range, each one-standard-deviation increase in performance pay satisfaction significantly contributes 0.273 standard deviations less to physician professionalism compared to those aged 30 and below.

In Model 4-4, the marginal effect of performance pay satisfaction on physician professionalism is influenced by the doctor's title. Contrasted with the junior title, the impact weakens for other title categories (-0.154, -0.274, -0.233). Significantly, both the Associate Senior and Senior title groups show differences, suggesting that for doctors with these titles, each one-standard-deviation increase in performance pay satisfaction contributes significantly less to physician professionalism compared to their junior counterparts - 0.274 and 0.233 standard deviations less, respectively.

In Model 4-5, the marginal effect of performance pay satisfaction on physician professionalism is influenced by the doctor's work experience. Compared to doctors with 5

years or less of experience, the impact diminishes for other experience categories (-0.403, -0.384, -0.193, -0.234).

Notably, there are significant differences in the 6-15 years and 16-25 years' experience groups, suggesting that for doctors with 6-15 years of experience, each one-standard-deviation increase in performance pay satisfaction significantly contributes 0.403 standard deviations less to physician professionalism compared to those with 5 years or less experience. Similarly, for doctors with 16-25 years of experience, there is a significant decrease of 0.384 standard deviations.

In Model 4-7, the marginal effect of performance pay satisfaction on physician professionalism is moderated by the pay ratio. Compared to doctors with a pay ratio below 20%, the impact of performance pay satisfaction on physician professionalism significantly increases by 0.314 for those with a pay ratio in the range of 51-60%. This implies that for doctors with a pay ratio in the 51-60% range, each one-standard-deviation increase in performance pay satisfaction contributes 0.314 standard deviations more to physician professionalism compared to those with a pay ratio below 20%.

In Model 4-9, the marginal effect of performance pay satisfaction on physician professionalism is influenced by the number of night shifts. Compared to doctors without night shifts, the impact diminishes for those with 2 or more-night shifts (-0.292, -0.503, -0.164). Particularly, there is a significant difference for doctors with 2-3-night shifts, indicating that for doctors with this frequency of night shifts, each one-standard-deviation increase in performance pay satisfaction significantly contributes 0.503 standard deviations less to physician professionalism compared to those without night shifts.

Chapter 6: Discussion and Conclusion

6.1 Discussion

6.1.1 Qualitative research on the impact of hospital pay-for-performance on physician professionalism

6.1.1.1 The relationship between main theories and the role of physician professionalism

In the theoretical relationship discovered through qualitative interviews, hospital pay-for-performance policies have influenced and changed its pay-for-performance satisfaction, as well as the professional cognition of clinicians, while pay-for-performance satisfaction and the professional cognition of clinicians have an impact on physician professionalism. The external factors other than hospital pay-for-performance also affect physician professionalism, their pay-for-performance satisfaction, and their professional cognition. Hospital pay-for-performance stimulates the clinical decision-making and medical behavior of physicians to a certain extent, resulting in different medical quality and outcomes, which in turn affects the hospital pay-for-performance policies. It has seven main impacts. (1) Hospital pay-for-performance affect physicians' pay-for-performance satisfaction or dissatisfaction. It mainly discussed the impact of the four dimensions of pay-for-performance (overall level, salary increase, salary management, and welfare) on physician professionalism, with the dimensions of the overall level and salary management having the greatest impact on physician professionalism. (2) The hospital pay-for-performance satisfaction affects physician professionalism. Pay-for-performance satisfaction includes the satisfaction of overall performance level, welfare guarantee, salary increase, and salary management. (3) Each dimension of pay-for-performance satisfaction has an impact on the professional behavior and cognition of physicians. For example, physicians' self-identification, including the sense of honor, belonging, and identity, can lead to behaviors such as resignation, motivation, gaming, and rent-seeking, as well as stress and emotional reactions. (4) These behaviors and cognition affect physician professionalism, which means that the changes in clinicians' identity and environmental perception affect their professionalism. (5) Clinicians' pay-for-performance satisfaction, behavioral cognition and physician professionalism ultimately affect the quality of medical services. (6) The level of medical quality reflects hospital pay-for-performance and management adjustment. (7)

External factors (such as social environment and social relationships) and external supervision also affect hospital pay-for-performance, medical quality, and clinicians' pay-for-performance satisfaction, behavioral cognition, and professionalism.

In summary, in the qualitative research theory, salary satisfaction is not only the result of pay-for-performance on individual clinicians, but also an important internal factor that affects physician professionalism.

6.1.1.2 Influencing factors of hospital pay-for-performance on physician professionalism

Although hospital pay-for-performance may improve medical quality by increasing clinicians' compliance with clinical guidelines (Cheng et al., 2023; Crawford et al., 2019; Lin et al., 2018; Metcalfe et al., 2019; Middleton, 2018; Navathe et al., 2019; Pourat & Kominski, 2019; Resnick, 2019), there is limited research evidence on the impact of hospital pay-for-performance on physician professionalism. Some researchers found that using hospital pay-for-performance could effectively improve physician professionalism (Zweifel & Janus, 2017a), such as improving the attitude towards patients (Mayumana et al., 2017), enhancing teamwork (Pronovost et al., 2015), and increasing empathy for patients (Neumann et al., 2011). While other researchers were concerned about the adverse effects of hospital pay-for-performance on physician professionalism, such as criticizing its potential impact on humanitarian assistance (Maio, 2015), undermining physicians' intrinsic motivation (Himmelstein et al., 2014), and possibly contradicting medical ethics (Zweifel & Janus, 2017a). The results of interviews on hospital pay-for-performance and physician professionalism in this study also suggest that each dimension of hospital pay-for-performance has different influences on physician professionalism, and the degree of influence on each dimension may also differ. Some incentive measures of hospital pay-for-performance may improve physician professionalism, but they may be offset by the unexpected consequences of other factors.

(1) From the basic norms dimension of physician professionalism, the dimensions of the overall level and salary management of pay-for-performance satisfaction significantly affect the sense of responsibility and integrity behavior of physicians. As stated by the surgical expert of SML13 said, "As a physician, I have the most basic moral bottom line, that is, the amount of money I receive does not directly affect my degree of responsibility towards patients. However, income will affect my work to some extent, because if the salary in this unit cannot cover my family expenses, I may have to choose other part-time jobs. Obviously, this will distract my energy, resulting in no more time for me to study the medical records of the diseases I encounter. Therefore, income has an indirect influence". The influence of performance level on medical

ethics is sometimes negative, as the respondent SME11 expert said, “Individual performance definitely has a negative impact on medical ethics. Some colleagues prescribe drugs with higher price returns to patients for the sake of their own performance, instead of prescribing drugs based on the condition. So, I think team performance will inhibit this behavior to a certain extent”.

(2) From the perspective of the new technologies and the application of new therapies of physician professionalism, the medical motto “to cure sometimes; to relieve often; to comfort always” is verified in terms of empathy and communication with patients. Due to the complexity of medicine, it is crucial to maintain good communication with patients, although the overall level and salary management may have a positive impact on it. A low overall level of pay-for-performance may not have a negative impact, but if it is too high, it will have a negative impact on communication. As the SME9 expert said, “The hospital encourages the interaction and communication between physicians and patients. If there is no reward, physicians may not spend a lot of energy to provide patients with emotional comfort, but if the reward is too little, it will not have a stimulating effect, and if the reward is too much, it will change the purpose of communication. Under the incentive of too high reward, physicians may interact with patients in pursuit of economic interests, which may not be their heartfelt desire to help patients, but only superficial efforts, that is, the motivation of interacting with patients is for economic benefits, which leads to excessive expenses for hospitals”. Therefore, for the setting of pay-for-performance, a reasonable design of pay-for-performance can effectively promote doctor-patient interaction, and team performance may be more conducive to the interaction.

(3) For the medical practice of physician professionalism, such as fair allocation of medical resources and humanitarian assistance, all dimensions of pay-for-performance have no impact on it. As stated by the SMYE7 expert, “Since I have chosen this profession, I will sincerely abide by the professional ethics of a doctor. I believe this is the most basic quality of a doctor. In the process of diagnosis and treatment, one should not think about performance, but rather about how to alleviate the pain of patients, and how to help them overcome the suffering of diseases. It is unethical to make patients pay more for diagnosis and treatment for the performance of the doctor, because it’s pitiful enough for the patient to have a disease, and if the patient suffers unnecessary losses in the economy, to be more serious, it equals to murder for gain”. The expert’s remarks represent a general view that the basic responsibilities of physicians should not be linked to performance, and performance should not have an impact on the humanitarian assistance of physicians, as this is the most basic responsibility of a physician.

It is difficult to quantify the basic moral and ethical standards of physicians with performance, but qualitative assessment can be conducted. As the SMLE5 expert pointed out, “For this type of assessment that cannot be quantified, qualitative assessment standards can be set, that is, to prioritize the negative list and set up reporting channels. For example, it should be stipulated that what physicians cannot do, which can to some extent protect the interests of patients and prevent physicians’ deviant behaviors”.

(4) For the improvement of physicians’ clinical ability and the pursuit of excellence based on the dimension of the inheritance and training of physician professionalism, the impact of hospital pay-for-performance on it is characterized by complexity and diversity. First of all, for the impact of performance level on physicians’ abilities, some respondents believed that the impact is not significant. As the SMYE2 expert said, “We really enjoy training, learning, and case discussions within the group, especially the multidisciplinary team (MDT) mode. Every MDT case discussion is a precious learning opportunity for me, and I can concentrate on learning and consulting. Although these studies and exchanges take up a lot of my rest time, compared with the health of patients, taking a short break is not a big deal, nor is it a problem of money. This type of MDT meeting is crucial for quickly learning about diseases and mastering reasonable diagnosis and treatment methods. The collective thinking to a certain extent allows us to think more comprehensively, which can effectively reduce the risk of diagnosis and treatment for patients. It is a good learning opportunity for physicians”. Despite low performance levels, physicians strive to learn and improve their clinical abilities, driven by the patient-centered philosophy, which has nothing to do with performance. The opposite view is that although material stimuli do not match the pursuit of excellence, it still has a certain effect. As SMTE5 experts said, “If there is no certain economic security, how can physicians have the mood to devote themselves to medical research. For example, when we studied for a master’s degree and a doctor’s degree, there were only some fixed subsidies, and it was very difficult. If there is no security, think about how difficult it can be”. However, this idea that “the economic base determines the superstructure” is very common among hospital physicians.

(5) For the fair allocation of medical resources based on the social value dimension of physician professionalism, salary management has no impact on the allocation of medical resources by physicians. As stated by the SMHE7 expert, “A few days ago, a family member of a patient wanted to change from the bed in the intensive care unit to a regular bed to save the cost. The hospital happened to have some regular beds available, so the patient’s family member wanted to switch from the intensive care unit to a regular bed. Our physicians explained for a long time about the dangers of changing the bed, but the patient’s family was not willing to

give up. Now physicians are in a very weak position. It is not a matter of money but a matter of patients' lives, so we firmly refused the request of the patient's family. The patient complained about us, and we became the subject of investigation, but I think I did the right thing". Individual physicians are unlikely to have much autonomy in the fair allocation of medical resources, but are often constrained by limited medical resources and put themselves in a difficult position.

In summary, in the qualitative interview with clinicians from Grade A tertiary hospitals in Sanming City, Fujian Province, the relationship between pay-for-performance satisfaction and physician professionalism is that physicians' satisfaction with performance level affects the dimensions of communication and emotion and moral responsibility of physician professionalism, and that the satisfaction with welfare guarantee of pay-for-performance affects the ability enhancement of clinicians, while the management of pay-for-performance structure affects various dimensions of physician professionalism, such as communication and emotion, moral responsibility, ability enhancement and basic norms.

6.1.2 Discussion on the Physician Professionalism Scale developed in this study

First of all, this study studied physician professionalism for the first time from the perspective of overall integration and interaction of subdivision variables of the five dimensions, namely basic norms, new technologies, and the application of new therapies, medical practice, training and inheritance, medical and social value, and developed a measurement model of physician professionalism under the joint action of these five perspectives, namely the Physician Professionalism Scale (PP-Scale). In the context of the Chinese culture, empirical data was used to analyze the willingness and behavior of hospital physicians in clinical practice, and reliable and effective analytical tools were provided for these analyses, which made up for the long-term lack of integrated, interactive and systematic empirical evidence support in this field. Secondly, the study used the PP-Scale to measure the dimensions of physician professionalism for the first time, and conducted preliminary tests on the impact of various dimensions of physician professionalism on the physician's professional commitment, which has positive theoretical and practical significance. Finally, the research found that for medical organizations that continue to focus on improving physician professionalism, they should actively pay attention to the relationship among various comprehensive factors and the physician's professional commitment in the process of medical practice. At the same time, paying attention to the impact of these different dimensional factors on physician professional commitment will help to improve the hospital's own physician professionalism, thereby enhancing the physician's professional commitment and the hospital's industry and international

competitiveness, which has important practical significance.

6.1.3 Quantitative research on the impact of hospital pay-for-performance on physician professionalism

The regression analysis results of this study indicate that improving the overall level of pay-for-performance satisfaction has a significant impact on physician professionalism. At the same time, it was found that the dimensions of hospital pay-for-performance (including overall level, welfare, salary increase, and salary management) have inconsistent impacts on the dimensions of physician professionalism (including basic norms, new technologies, and the application of new therapies, medical practice, training and inheritance, medical and social value). The dimensions of welfare and salary management play a positive balancing role. While the dimension of the overall level of the hospital's pay-for-performance satisfaction is negatively correlated with the dimensions of physician professionalism, and it has a significant negative impact on the dimensions of training and inheritance and medical and social value of physician professionalism. According to the definition of salary satisfaction, we infer that clinicians' pay-for-performance satisfaction depends on two factors: one is the level of pay-for-performance received, and the other is the level of performance expectations. In other words, the higher level of pay-for-performance satisfaction indicates that they receive higher pay-for-performance, or they have low performance expectations. For clinicians with low performance expectations, according to the Goal Setting Theory (GST) in the motivation theory, easily achievable goals are difficult to motivate them and the effect of motivation is reduced. For clinicians with high pay-for-performance, under the current pay-for-performance system, it often means a higher workload.

(1) In terms of empathy in the dimension of the connotation of physician professionalism, physicians with a higher workload have less average visit time for patients and less time to communicate with patients, which reduces the subjective feelings of patients and physicians. Research has shown that if physicians spend more time with patients, it will positively affect their empathy towards patients (Neumann et al., 2011).

(2) For the communication and cooperation in the dimension of the medical practice of physician professionalism, the implementation of individual pay-for-performance for physicians may encourage competition and undermine personal interests, thus inhibiting cooperation. Research has shown that the team performance reward system is more conducive to the effective operation of organizations and the collective participation of physicians. As healthcare providers increasingly provide care to patients in teams or groups, such as in the

form of a multidisciplinary team (MDT), team-based performance rather than just individual work, may be more effective in promoting clinicians' communication and collaboration, improving the team environment and enhancing physician professionalism.

(3) For the historical development of physician professionalism and the integrity, honesty, and strong sense of responsibility of medical and social values, the satisfaction in the dimension of the overall level of pay-for-performance has a significant negative impact on physician professionalism. This may be related to the economic stimulus that change the behavioral motivation of physicians. We speculate that if clinicians have high satisfaction with pay level, they may attribute the behavioral motivation to the pursuit of performance goals, especially for many behaviors with high moral standards, such as prosocial behavior. When physicians receive satisfactory financial or material rewards, their intrinsic motivation will be undermined. Behavioral economics studies show that monetary rewards can undermine the intrinsic motivation of clinicians (Himmelstein et al., 2014), and pay-for-performance may have adverse effects on clinicians' motivation in the medium and short term (Chenot, 2017). Moreover, studies have shown that the performance system is difficult to influence the strength of the accountability mechanism. Once negative nonprofessional behaviors regarding the integrity, honesty, and strong sense of responsibility of physician professionalism cannot receive timely feedback, their intrinsic motivation will be more severely undermined. Studies abroad have also shown that using strong financial incentives tends to reduce the intrinsic motivation of clinicians to act for the benefit of patients (Benzer et al., 2014).

(4) The pursuit of excellence in the dimension of training and inheritance of physician professionalism refers to that clinicians must be lifelong learners, have the responsibility to constantly update the medical knowledge and clinical skills, and develop team spirit to ensure medical quality (Blank et al., 2003). However, in the regression analysis of the pursuit of excellence in the dimension of training and inheritance, the satisfaction of welfare and salary management have a significant positive impact, while the overall level and salary increase satisfaction have a negative impact, but not significant. Although from the original intention of the design of the pay-for-performance system, there is a positive relationship between the pay level and employees' ability enhancement, that is, through the pay-for-performance system, the distribution system that the able people do more work and more pay is for more work is realized, and this system drives employees to continuously improve their abilities. However, the result did not meet this expectation. On the one hand, according to the expectancy theory, the intensity of stimulation is the product of expectation and valence. Therefore, we speculate that it is possible that it may be caused by the low valence of ability enhancement in the performance

system. In other words, the reward for ability enhancement in the performance system is too low to generate effective stimulation. In addition, it is possible that the existing pay-for-performance system lacks the evaluation or timely and effective feedback on the abilities of physicians. On the other hand, according to the famous theory of motivation-hygiene factors proposed by the American behavioral scientist Frederick Herzberg, welfare and company policies and management belong to health factors. Merely creating an active learning environment for clinicians can only eliminate dissatisfying factors but not generate incentives.

(5) According to the regression results of the fair allocation of medical resources, the fulfillment of humanitarianism, and the adherence to ethical standards in the dimension of medical practice of physician professionalism, the satisfaction of welfare and salary management significantly affects physicians' fair allocation of medical resources, the fulfillment of humanitarianism and ethics. The satisfaction of clinicians with the management of a pay-for-performance structure can improve the score of this dimension, which may be due to the fact that the optimal allocation of health services mainly comes from the hospital system. Clinicians have limited influence in the allocation of medical resources, such as bed allocation and the acceptance of acute and serious patients, making it difficult to achieve the Pareto improvement. If these factors are not fully considered in hospital pay-for-performance, clinicians will not only be dissatisfied with the management structure of pay-for-performance, but even have a game behavior of choosing patients and avoiding risks, which will be reflected as low scores in the allocation of medical resources, the fulfillment of humanitarianism, and the adherence to ethical standards in the dimension of medical and social values.

In summary, under the existing performance distribution method directly linked to workload, the potential unintended consequences of workload increase make it difficult for a single increase in pay-for-performance satisfaction to have a positive effect on physician professionalism. For the integrity aspect that has always been adhered to in the dimension of the historical development of physician professionalism, more effective evaluation methods should be established to enhance the intrinsic motivation of physician professionalism. For example, the Johns Hopkins Hospital (JHH)'s four-member quality improvement framework based on the intrinsic motivation of clinicians, can improve the performance of medical processes (Austin & Pronovost, 2016), and emphasizes feedback. Another example is that the Cleveland Clinic uses annual physician performance evaluations to provide continuous feedback during the evaluation period.

6.1.4 Regression analysis of the impact of hospital pay-for-performance on physician professionalism

By introducing the interaction terms of each variable into the regression model, we found that the marginal effect of pay-for-performance satisfaction on physician professionalism is moderated by age, professional title, and years of service. The increase of marginal benefit in the pay-for-performance satisfaction of the hospital with physician professionalism in the age group of 30 and above is smaller than that in the age group of 30 and below. The increase of marginal benefit of the senior and deputy senior groups is significantly smaller than that of the junior professional title group. The increase of marginal benefit of the group with more than six years of service is smaller than those with less than five years of service. And the increase of marginal benefit of the group with an average of three-night shifts per month is smaller than the group with an average of two- or three-night shifts or less per month. We speculate that this may be due to the improvement of personal economic level brought about by the increase in age, years of service, and the improvement of professional title levels, which weakens economic incentives. On the contrary, for junior clinical physicians with younger age and shorter years of service, their pay-for-performance satisfaction with the hospital has the highest marginal effect on physician professionalism. This indicates that the pay-for-performance system of the hospital has a decreasing incentive effect on physician professionalism, which is similar to the results of some foreign research results, that is, physicians with the worst performance receive the most improvement, and the effect of economic incentives is proportional to the degree of physicians' needs (Mianda et al., 2021). For clinicians with specific age groups, professional titles and years of service, setting reasonable pay-for-performance will have a more significant marginal effect on physician professionalism. Therefore, it is imperative to develop more flexible pay-for-performance policies, which can maximize the positive stimulating effect of pay-for-performance.

The results of this study indicate that there is no significant gender difference in physician professionalism, although some studies found a high correlation between them (Azer & Azer, 2019; Mendelson et al., 2017; Milstein & Schreyoegg, 2016), perhaps because this study comprehensively measured the five dimensions of physician professionalism (basic norms, new technologies, and the application of new therapies, medical practice, training and inheritance, and medical and social value), while previous studies tended to focus on a single dimension. There was no significant difference in physician professionalism in the group of demography (gender, age, education level, professional title, years of service, and department). However, in

the group of the variable of work status, the physician group with an average daily sleep time of less than six hours was found to have significantly lower physician professionalism than other groups with an average daily sleep time of more than six hours, which may be due to the influence of work fatigue on physician professionalism (Ćulibrk et al., 2018). The study found that clinicians with different pay-for-performance ratios had significant differences in the overall level of physician professionalism. Clinicians whose pay-for-performance accounted for 71% to 80% of their income had significantly lower physician professionalism than other groups.

This part of the study conducted an empirical test of the proposed hypothesis, and at the same time explained the possible path of the impact of hospital performance satisfaction on physician professionalism through the motivation theory, to provide decision-makers of medical institutions and the medical system with references for the reform of hospital performance to improve physician professionalism. The limitation of the study is that the interviews and questionnaires only cover two tertiary hospitals in Sanming City, Fujian Province. As this study did not have the condition for data collection across provinces, cities and autonomous regions, there is no data on cultural differences, consumption habits, and economic levels. Therefore, this study did not delve into the possible differences in the influencing factors and mechanisms of these differences.

6.2 Conclusion

6.2.1 Conclusion of qualitative meta-analysis research

Although it is self-evident that qualitative meta-analysis is important for the structural development and measurement of organizational research, research on the conceptualization of organizations and organizational processes is relatively early and not fully mature. The study believes that the academic community should be open to the development of new concepts and theories. This study uses a more scientific qualitative meta-analysis method, draws on the “integration” concept of qualitative meta-analysis, and applies the qualitative strategy of qualitative meta-analysis. The study systematically integrated empirical studies with similar themes for reanalysis and comparison to interpret the findings and evidence support in existing research. Then the researchers condensed various categories that appear in different empirical studies to enhance systematic interaction and effective integration of knowledge, identify previously undiscovered implicit knowledge from empirical research, and enrich the current

knowledge system. Besides, the researchers selected core journal literature with high reliability and excluded irrelevant or less relevant literature to ensure the high quality of research results. In addition, the researchers employed strict qualitative research procedures such as excerpting, coding, and categorization, and interpreted the results of the qualitative analysis in a systematical way to construct a rigorous physician professionalism concept system.

6.2.2 Expert interview research conclusion

Through in-depth interviews and analysis of clinicians from tertiary hospitals in Sanming City, Fujian Province, based on their own views and viewpoints on pay-for-performance and physician professionalism, this study clarifies the relationship between hospital performance, physician professionalism, medical quality, satisfaction, physicians' behavioral cognition, and external environment. Firstly, based on the literature research, the outline for the interview was formed. Secondly, this study aims to verify that pay-for-performance satisfaction is still an important factor in the impact of pay-for-performance on physician professionalism, and to verify the mutual confirmation between expert opinions and the motivation theory of literature research, which has a certain theoretical foundation. Third, through the qualitative analysis of interviews, this study believes that the structure management and level of pay-for-performance satisfaction are the main factors affecting physician professionalism, and it is particularly important to explore the influence of different factors and the incentive mechanism of pay-for-performance satisfaction on physician professionalism, which can guide the pay-for-performance itself to stimulate the improvement of physician professionalism in a more diversified way.

6.2.3 Physician Professionalism Scale

The Physician Professionalism Scale (PP-Scale) was developed and used to empirically test the relationship among the theories of pay-for-performance satisfaction of the hospital. First of all, the research collected, organized and reviewed the literature related to physician professionalism based on keywords, and determined the basic framework, core concepts and conceptual dimensions of this study. Secondly, based on the literature and interview method, combined with the data collection method of the questionnaire survey, the initial PP-Scale with 21 items was initially formed in this study, and a survey was conducted in two Grade A tertiary hospitals in Sanming City, Fujian Province, China. The management of these hospitals assisted in issuing questionnaires during the breaks of routine meetings, and department heads were

responsible for questionnaire collection. Then, based on item analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and reliability and validity testing, this study ultimately determined a formal PP-Scale with five dimensions and 20 items. Based on the scale, this study used the existing literature and survey data to preliminarily examine the impact of physician professionalism on the professional commitments of physicians. The empirical results show that the five dimensions of the PP-Scale (basic norms, new technologies, and the application of new therapies, medical practice, training and inheritance, and medical and social value of physician professionalism) have a significant positive impact on the professional commitments of physicians. That is, all regression models passed the F-test and were overall significant, and all regression coefficients showed a significant positive correlation.

6.2.4 The relationship between PFPS and physician professionalism

This study explored the influencing factors of hospital pay-for-performance on the physician professionalism. The results of multiple linear regression showed that the pay-for-performance satisfaction of the hospital was positively correlated with the level of physician professionalism, and the impact of various dimensions of the pay-for-performance satisfaction of the hospital was inconsistent. The level of satisfaction is negatively correlated with the basic norms, new technologies and the application of new therapies of physician professionalism, while welfare security is positively correlated with the medical practice of physician professionalism, and the satisfaction of salary management is positively correlated with the training and inheritance and medical and social value of physician professionalism.

The research results show that the marginal effect of the pay-for-performance satisfaction of the hospital on physician professionalism is moderated by demographic variables (such as age, professional title, and years of service) and the variables of work status (such as the average number of monthly night shifts).

6.3 Contribution and inspiration

Firstly, this research studied physician professionalism for the first time from the perspective of systematic interaction and integration in the five dimensions, including basic norms, new technologies, and the application of new therapies, medical practice, training and inheritance, and medical and social value. The PP-Scale was developed under the interaction and integration of the five dimensions. Secondly, this study for the first time used empirical data to conduct an empirical analysis of physician professionalism in the cultural context of Chinese public

hospitals, and provided reliable and effective analytical tools for these analyses, making up for the shortcomings of the long-term lack of multi-dimensional, integrated, interactive and systematic empirical evidence support in this field. Third, the study used the developed PP-Scale to measure the multi-dimensions of professional commitment in the workplace for the first time, and conducted a preliminary test of “the impact of physician professionalism on the physician’s professional commitment”, which has positive theoretical and practical significance for hospitals and physicians affected by the COVID-19 epidemic and the international trade blockade. Finally, the study of regression analysis found that the various dimensions of physician professionalism, as well as the relationship between the interaction of these dimensions and the pay-for-performance satisfaction of the hospital, will be conducive to improving the physician professionalism in Chinese hospitals, and providing useful insights for setting reasonable pay-for-performance for the medical and health system. Therefore, it can promote the positive work behavior and work attitude of physicians in specific work or situations, and turn difficulties into motivation and continue to work hard, which has important practical significance for enhancing the industry and international competitiveness of hospitals.

6.4 Research limitations and improvements

Firstly, the limitation of this study is that the sample area is relatively simple. The data source for the developed scale is limited to two Grade A tertiary hospitals in Sanming City, Fujian Province, China. Although the sample size is relatively large, it is concentrated in one city in Sanming City, Fujian Province. Due to resource constraints, it is not possible to consider the impact of economic differences in larger organizations and different regions. For example, using the scale in larger organizations and across China may affect the validity and external validity of the scale. In future studies, the researchers can expand the types of organizations and geographic sources of data collection, for example, by collecting measurement data that emphasizes the cultivation of physician professionalism in larger organizations nationwide. In this way, the researchers can further verify the reliability and validity of the scale through more comprehensive quantitative data. Secondly, due to the objective conditions of data collection, this study did not conduct multiple rounds of questionnaire data collection. Therefore, the analysis of the physician’s professional commitment was not in-depth enough. The study did not consider the impact of variables such as self-reflection and leader member exchange (LMX) on physician professionalism and the physician’s professional commitment. And factors such as physician professionalism, LMX, and self-reflection may also affect the physician’s

professional commitment. Third, the main shortcoming of this study is that the influence of common method bias on the results cannot be completely ruled out. Although when developing the scale, the researchers used the methods of anonymous filling and random sorting of question items, the researchers still could not completely rule out the possible common variance. Fourth, this study did not evaluate the impact of different performance measurement methods (Outputs vs outcomes/health gains), on the professionalism and on the conditions to promote organizational learning. In future research, we will add evaluating the impact of the different performance ways of measurement on the professionalism and on the learning organization.

Bibliography

- ABIM Foundation, ACP-ASIM Foundation, & European Federation of Internal Medicine. (2002). Medical professionalism in the new millennium: a physician charter. *Annals of Internal Medicine*, 136(3), 243-246.
- Adams, J. S. (1965). *Inequity in social exchange*. New York Academic Press.
- Aeon, B., Faber, A., & Panaccio, A. (2021). Does time management work? A meta-analysis. *Plos One*, 16(1), e0245066.
- Alderfer, C. P. (1969). An empirical test of a new theory of human needs. *Organizational Behavior and Human Performance*, 4(2), 142-175.
- Alhenaidi, A., Al-Haqan, A., Kelendar, H., Al-Bader, B., Alkandari, O., & Al-Zuabi, H. (2023). The association of professional burnout and turnover intentions among intensive care units physicians: A cross-sectional study. *Journal of Medical Care Organization, Provision and Financing*, 60, 469580231206253.
- American Hospital Association. (2019). *Evolving care models: aligning care delivery to emerging payment models*. American Hospital Association.
- American Society of Clinical Oncology. (2019). *Patient-Centered Oncology Payment: A community-based oncology medical home model*. American Society of Clinical Oncology.
- Amir, Q., Vincenza, S., Alice, G., David, G., Keith, M., David, W., Kevin, B. W., & Eric, C. S. (2010). Pay-for-performance through the lens of medical professionalism. *Annals of Internal Medicine*, 152(6), 366-369.
- Arnold, E., Blank, L. L., Race, K. E., & Cipparrone, N. E. (1998). Can professionalism be measured? The development of a scale for use in the medical environment. *Academic Medicine*, 73, 1119-1121.
- Ashworth, M., & Marshall, M. (2015). Financial incentives and professionalism: another fine mess. *British Journal of General Practice*, 65(637), 394-395.
- Auer, E. M., Behrend, T. S., Collmus, A. B., Landers, R. N., & Miles, A. F. (2021). Pay-for-performance, satisfaction and retention in longitudinal crowdsourced research. *Plos One*, 16(1), e0245460.
- Austin, J. M., & Pronovost, P. J. (2016). Improving performance on core processes of care. *Current Opinion in Allergy & Clinical Immunology*, 16(3), 224-230.
- Ayoub, J. J., Abiad, M., Forman, M. R., Mina, C., Honein-AbouHaidar, G., & Naja, F. (2018). The interaction of personal, contextual, and study characteristics and their effect on recruitment and participation of pregnant women in research: a qualitative study in Lebanon. *BMC Medical Research Methodology*, 18(1), 155.
- Azer, S. A., & Azer, S. (2019). Top-cited articles in medical professionalism: a bibliometric analysis versus altmetric scores. *BMJ Open*, 9, e029433.
- Bae, K. B. (2023). The effect of pay for performance on work attitudes in the private, public, and nonprofit sectors: a panel study from South Korea. *International Review of Administrative Sciences*, 89(1), 186-201.
- Baker, G. P., Jensen, M. C., & Murphy, K. J. (1988). Compensation and incentives: practice vs. theory. *The Journal of Finance*, 43(3), 593-616.
- Banerjee, S., McCormick, D., Paasche-Orlow, M. K., Lin, M. Y., & Hanchate, A. D. (2019). Association between degree of exposure to the Hospital Value Based Purchasing Program and 30-day mortality: experience from the first four years of Medicare's pay-for-performance program. *BMC Health Services Research*, 19(1), 921.

- Bao, G. M., & Liu, X. (2011). A multidimensional concept model on the perceived organizational support for Chinese employee. *Science Research Management*, 32(2), 160-168.
- Barber, A. E., & Simmering, M. J. (2003). Understanding pay plan acceptance: the role of distributive justice theory. *Human Resource Management Review*, 12(1), 25-42.
- Bateman, T. S., & Organ, D. W. (1983). Job satisfaction and the good soldier: the relationship between affect and employee "citizenship". *Academy of Management Journal*, 26(4), 587-595.
- Benzer, J. K., Young, G. J., Burgess, J. F., Jr, B. E., Mohr, D. C., Charns, M. P., & Kaboli, P. J. (2014). Sustainability of quality improvement following removal of pay-for-performance incentives. *Journal of General Internal Medicine*, 29(1), 127-132.
- Berk, R. A. (2009). Using the 360 degrees multisource feedback model to evaluate teaching and professionalism. *Medical Teacher*, 31(12), 1073-1080.
- Bidari, S., Kamyab, M., Kakav, R., & Komeili, A. (2023). Performance of surface topography systems in scoliosis management: a narrative review. *Journal of Prosthetics and Orthotics*, 35(3), Journal of prosthetics and orthotics.
- Blank, L., Kimball, H., McDonald, W., Merino, J., ABIM Foundation, ACP Foundation, & European Federation of Internal Medicine. (2003). Medical professionalism in the new millennium: a physician charter 15 months later. *Annals of Internal Medicine*, 138(10), 839-841.
- Brosig-Koch, J., Hennig-Schmidt, H., Kairies-Schwarz, N., & Wiesen, D. (2015). Using artefactual field and lab experiments to investigate how fee-for-service and capitation affect medical service provision. *Journal of Economic Behavior & Organization*, 131(B), 17-23.
- Bu, L. J. (2015). *The research on doctors' occupational spirit* [Doctoral dissertation]. Shandong University.
- Burnes, B., & Cooke, B. (2013). Kurt lewin's field theory: a review and re valuation. *International Journal of Management Reviews*, 15(4), 408-425.
- Burrell, G., Hyman, M. R., Michaelson, C., Nelson, J. A., Taylor, S., & West, A. (2022). The ethics and politics of academic knowledge production: thoughts on the future of business ethics. *Journal of Business Ethics*, 180(3), 917-940.
- Campbell, E. G., Regan, S., Gruen, R. L., Ferris, T. G., Rao, S. R., Cleary, P. D., & Blumenthal, D. (2007). Professionalism in medicine: results of a national survey of physicians. *Annals of Internal Medicine*, 147(11), 795-802.
- Carr, P. J., Higgins, N. S., Cooke, M. L., Mihala, G., & Rickard, C. M. (2018). Vascular access specialist teams for device insertion and prevention of failure. *The Cochrane Database of Systematic Reviews*, 3(3), 1-36.
- Casalino, L. P., & Khullar, D. (2019). Value-based purchasing and physician professionalism. *JAMA*, 322(17), 1647-1648.
- Cassel, C. K., & Jain, S. H. (2012). Assessing individual physician performance: does measurement suppress motivation? *Jama-Journal of the American Medical Association*, 307(24), 2595-2596.
- Cattel, D., Eijkenaar, F., & Schut, F. T. (2020). Value-based provider payment: towards a theoretically preferred design. *Health Economics, Policy, and Law*, 15(1), 94-112.
- Chang, E., Ali, R., Seibert, J., & Berkman, N. D. (2023). Interventions to improve outcomes for high-need, high-cost patients: a systematic review and meta-analysis. *Journal of General Internal Medicine*, 38(1), 185-194.
- Chen, G., & Feng, Z. (2014). 关于加强医生绩效考核体系中专业精神的思考 [Thinking on strengthening the professional spirit of doctors in the performance evaluation system]. *Medicine and Philosophy*, (4), 65-67.
- Chen, J. (2016). *Study on the current condition and influence factors of clinical nurse*

- performance pay satisfaction* [Doctoral dissertation]. North China University of Science and Technology.
- Chen, J., Xu, J., & Zhang, C. (2013). 中国两家三级医院临床医生的医疗专业精神 [Medical professionalism among clinical physicians in two tertiary hospitals, China]. *Social Science & Medicine*, (96), 290-296.
- Chen, L. L. (2015). *The development and evaluation research on the scale of medical professionalism* [Master's thesis]. North China University of Science and Technology.
- Chen, X. (2013). 敬业精神是医生对社会的承诺 [The professionalism of doctors is the commitment of doctors to the society]. *Chinese Medical Ethics*, 26(2), 135.
- Cheng, N., Li, H., & Bang, Y. (2023). Pay-for-performance schemes and hospital hit adoption. *Decision Support Systems*, 64(1), 1-10.
- Chenot, R. (2017). Pay for performance in dental care: a systematic narrative review of quality P4P models in dental care. *Zeitschrift Fur Evidenz, Fortbildung Und Qualitat Im Gesundheitswesen*, 127, 42-55.
- Coleman, D. L., & Joiner, K. A. (2021). Physician incentive compensation plans in academic medical centers: the imperative to prioritize value. *The American Journal of Medicine*, 134(11), 1344-1349.
- Conway, P. H., & Cassel, C. K. (2012). Engaging physicians and leveraging professionalism: a key to success for quality measurement and improvement. *JAMA*, 308(10), 979-980.
- Crawford, M. J., Huddart, D., Craig, E., Zalewska, K., & Cooper, S. J. (2019). Impact of secondary care financial incentives on the quality of physical healthcare for people with psychosis: a longitudinal controlled study. *The British Journal of Psychiatry*, 215(6), 1-6.
- Cruess, R. L., Cruess, S. R., Boudreau, J. D., Snell, L., & Steinert, Y. (2014). Reframing medical education to support professional identity formation. *Journal of the Association of American Medical Colleges*, 89(11), 1446-1451.
- Cruess, R. L., Cruess, S. R., Boudreau, J. D., Snell, L., & Steinert, Y. (2015). A schematic representation of the professional identity formation and socialization of medical students and residents: a guide for medical educators. *Journal of the Association of American Medical Colleges*, 90(6), 718-725.
- Cruess, S. R., Johnston, S., & Cruess, R. L. (2005). 'Profession': a working definition for medical educators. *Teaching & Learning in Medicine*, 16(1), 74-76.
- Ćulibrk, J., DeliĆ, M., Mitrovic, S., & Culibrk, D. (2018). Job satisfaction, organizational commitment and job involvement: the mediating role of job involvement. *Frontiers in Psychology*, 9, 132.
- David, H., Shipra, G., Richard, C., Sylvia, C., Rhena, D., & Fred, H. (2011). Assessment of professionalism: recommendations from the Ottawa 2010 Conference. *Medical Teacher*, 33(5), 354-363.
- Davlyatov, G., Borkowski, N., Qu, H., Burke, D., Bronstein, J., & Brickman, A. (2021). Are community health centers' chief executive officers' compensation related to clinical performance? *Healthcare Management Review*, 46(2), 162-171.
- DeCamp, M., & Snyder Sulmasy, L. (2021). Ethical and professionalism implications of physician employment and health care business practices: a policy paper from the American College of Physicians. *Annals of Internal Medicine*, 174(6), 844-851.
- Deloitte Center for Health Solutions. (2016). *The evolution of oncology payment models: what can we learn from early experiments*. Deloitte Development LLC.
- Diaconu, K., Falconer, J., Verbel, A., Fretheim, A., & Witter, S. (2021). Paying for performance to improve the delivery of health interventions in low- and middle-income countries. *The Cochrane Database of Systematic Reviews*, 5(5), CD007899.
- Dreher, G. F., Ash, R. A., & Bretz, R. D. (2010). Benefit coverage and employee cost: critical factors in explaining compensation satisfaction. *Personnel Psychology*, 41(2), 237-254.

- Du, Z. Z. (2007). On the issues of medical professionalism. *Medical and Philosophy (Humanistic & Social Medicine Edition)*, 28(03), 1-5, 9.
- Edgington, & Eugene, S. (1967). Review of the discovery of grounded theory: strategies for qualitative research. *Canadian Psychologist/Psychologie Canadienne*, 8(4), 360.
- Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied Psychology*, 71(3), 500-507.
- Elliott, M. N., Beckett, M. K., Lehrman, W. G., Cleary, P., Cohea, C. W., & Giordano, L. A. (2016). Understanding the role played by medicare's patient experience points system in hospital reimbursement. *Health Affairs (Project Hope)*, 35(9), 1673-1680.
- Farias, F. A. C., Dagostini, C. M., Bicca, Y. A., Falavigna, V. F., & Falavigna, A. (2020). Remote patient monitoring: A systematic review. *Telemedicine Journal and E-health*, 26(5), 576-583.
- Freeman, J. B., Stolier, R. M., & Brooks, J. A. (2020). Dynamic interactive theory as a domain-general account of social perception. *Advances in Experimental Social Psychology*, 61, 237-287.
- Fung, C. H., Lim, Y. W., Mattke, S., Damberg, C., & Shekelle, P. G. (2008). Systematic review: the evidence that publishing patient care performance data improves quality of care. *Annals of Internal Medicine*, 148(2), 111-123.
- Gadsden, T., Mabunda, S. A., Palagyi, A., Maharani, A., Sujarwoto, S., Baddeley, M., & Jan, S. (2021). Performance-based incentives and community health workers' outputs, a systematic review. *Bulletin of the World Health Organization*, 99(11), 805-818.
- Gagné M., & Forest, J. (2008). The study of compensation systems through the lens of self-determination theory: Reconciling 35 years of debate. *Canadian Psychology / Psychologie Canadienne*, 49(3), 225-232.
- Garrison, L., Towse, A., Briggs, A., Pouvourville, G., Grueger, J., & Mohr, P. E. (2013). Performance-based risk-sharing arrangements-good practices for design, implementation, and evaluation: report of the ISPOR good practices for performance-based risk-sharing arrangements task force. *Journal of the International Society for Pharmacoeconomics and Outcomes Research*, 16(5), 703-719.
- Gettel, C. J., Han, C. R., Granovsky, M. A., Berdahl, C. T., Kocher, K. E., & Mehrotra, A. (2022). Emergency clinician participation and performance in the centers for medicare & medicaid services merit-based incentive payment system. *Academic Emergency Medicine: Official Journal of the Society for Academic Emergency Medicine*, 29(1), 64-72.
- Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: notes on the Gioia methodology. *Organizational Research Method*, 16(1), 15-31.
- Godager, G., & Wiesen, D. (2013). Profit or patients' health benefit? Exploring the heterogeneity in physician altruism. *Journal of Health Economics*, 32(6), 1105-1116.
- Green, P., Finkel, E., Fitzsimons, G., & Gino, F. (2017). The energizing nature of work engagement: Toward a new need-based theory of work motivation. *Research in Organizational Behavior*, 37, 1-18.
- Greenberg, J. K., Olsen, M. A., Poe, J., Dibble, C. F., Yamaguchi, K., & Kelly, M. P. (2021). Administrative data are unreliable for ranking hospital performance based on serious complications after spine fusion. *Spine*, 46(17), 1181-1190.
- He, W. (2013). *Research on the influence and action mechanism of salary distribution difference on employee psychology* [Doctoral Dissertation]. Huazhong University of Science and Technology.
- Heider, F. (1944). *Social perception and causality in the phenomenal world*. New York University Press.
- Hemenway, D., Killen, A., Cashman, S. B., Parks, C. L., & Bicknell, W. J. (1990). Physicians' responses to financial incentives. Evidence from a for-profit ambulatory care center. *The*

- New England Journal of Medicine*, 322(15), 1059-1063.
- Heneman, H. G., & Schwab, D. P. (1985). Pay satisfaction: its multidimensional nature and measurement. *International journal of psychology. Journal International De Psychologie*, 29(1), 129-141.
- Hennig-Schmidt, H., Selten, R., & Wiesen, D. (2011). How payment systems affect physicians' provision behaviour--an experimental investigation. *Journal of Health Economics*, 30(4), 637-646.
- Herbert, H. G., & Donald, P. S. (1985). Pay satisfaction: its multidimensional nature and measurement. *International Journal of Psychology*, 20(1), 129-141.
- Herzberg, F. (1959). *Motivational Factors at Work*. John Wiley.
- Herzer, K. R., & Pronovost, P. J. (2015). Physician motivation: listening to what pay-for-performance programs and quality improvement collaboratives are telling us. *Joint Commission Journal on Quality and Patient Safety*, 41(11), 522-528.
- Hillier, D., Mccolgan, P., Tsekeris, A., Pope, P. F., Stark, A. W., & Walker, M. (2020). Value creation around merger waves: the role of managerial compensation. *Journal of Business Finance & Accounting*, 47(1-2), 132-162.
- Hillis, D. J., & Grigg, M. J. (2015). Professionalism and the role of medical colleges. *The Surgeon*, 13(5), 292-299.
- Himmelstein, D., Ariely, D., & Woolhandler, S. (2014). Pay-for-performance: toxic to quality? Insights from behavioral economics. *International Journal of Health Services*, 44, 203-214.
- Ho, M. J., Yu, K. H., & Hirsh, D. (2011). Does one size fit all? Building a framework for medical professionalism. *Academic Medicine*, 86(11), 1407-1414.
- Hochberg, M. S., Berman, R. S., & Alet, A. L. (2012). The professionalism curriculum as a cultural change agent in surgical residency education. *The American Journal of Surgery*, 203(1), 14-20.
- Honghe, L., Ning, D., Yuanyuan, Z., Yang, L., Deliang, W., & Gianni, V. (2017). Assessing medical professionalism: a systematic review of instruments and their measurement properties. *Plos One*, 12(5), e0177321.
- Hu, L., & Wu, J. (2022). 四川省三级公立医院临床护士专业薪酬满意度现状 [Current situation of professional salary satisfaction of clinical nurses in tertiary public hospitals in Sichuan Province]. *Smart Health*, 8(23), 26-32.
- Huang, L. F., & Fu, Y. (2013). Exploring the motivational strategies of teachers in independent colleges based on Neo-Behaviorism Theory. *Time Education*, 13, 1-2.
- Hultman, C. S., Connolly, A., & Halvorson, E. G. (2012). Get on your boots: preparing fourth — year medical students for a career in surgery, using a focused curriculum to teach the competency of professionalism. *Journal of Surgery Research*, 177(2), 217-222.
- Hysong, S. J., SoRelle, R., Broussard Smitham, K., & Petersen, L. A. (2017). Reports of unintended consequences of financial incentives to improve management of hypertension. *Plos One*, 12(9), e0184856.
- Im, D., Pyo, J., Lee, H., Jung, H., & Ock, M. (2023). Qualitative research in healthcare: data analysis. *Journal of Preventive Medicine and Public Health*, 56(2), 100-110.
- Irby, D. M., & Hamstra, S. J. (2016). Parting the clouds: three professionalism frameworks in medical education. *Academic Medicine Journal of the Association of American Medical Colleges*, 91(12), 1606-1611.
- Jin, J. (2019). *The influence of hospital pay-for-performance satisfaction on physician professionalism—based on the investigation of physician professionalism in tertiary hospitals in Liaoning province*. China [Doctoral dissertation]. China Medical University.
- Khalaf, K., Mustafa, A., Wazzan, M., Omar, M., Estaitia, M., & El-Kishawi, M. (2022). Clinical effectiveness of space maintainers and space regainers in the mixed dentition: A systematic review. *The Saudi Dental Journal*, 34(2), 75-86.

- Khalife, J., Ekman, B., Ammar, W., El-Jardali, F., Al Halabi, A., Barakat, E., & Emmelin, M. (2023). Exploring patient perspectives: A qualitative inquiry into healthcare perceptions, experiences and satisfaction in Lebanon. *PloS One*, 18(8), e0280665.
- Khan, N., Rudoler, D., McDiarmid, M., & Peckham, S. (2020). A pay-for-performance scheme in primary care: Meta-synthesis of qualitative studies on the provider experiences of the quality and outcomes framework in the UK. *Bmc Family Practice*, 21(1), 142.
- Khullar, D., Wolfson, D., & Casalino, L. P. (2018). Professionalism, performance, and the future of physician incentives. *Jama-Journal of the American Medical Association*, 320(23), 2419-2420.
- Kim, W. C., & Ren é, A. M. (1996). Procedural justice and managers' in-role and extra-role behavior: the case of the multinational. *Management Science*, 42(4), 499-515.
- Kinicki, A. J., Mckee-Ryan, F. M., Schriesheim, C. A., & Carson, K. P. (2002). Assessing the construct validity of the job descriptive index: a review and meta-analysis. *The Journal of Applied Psychology*, 87(1), 14-32.
- Kirch, D. G., Gusic, M. E., & Ast, C. (2015). Undergraduate medical education and the foundation of physician professionalism. *Journal of the American Medical Association*, 313(18), 1797-1798.
- Kline, R. B., & Little, T. D. (2011). *Principles and practice of structural equation modeling*. Guilford Press.
- Korenstein, D., Duan, K., & Diaz, M. J. (2016). Do health care delivery system reforms improve value? The jury is still out. *Medical Care*, 254(1), 55-66.
- Kurnat-Thoma, E. (2020). Educational and ethical considerations for genetic test implementation within health care systems. *Network and Systems Medicine*, 3(1), 58-66.
- Lalani, M., Hall, K., Skrypak, M., Laing, C., Welch, J., & Toohey, P. (2018). Building motivation to participate in a quality improvement collaborative in NHS hospital trusts in southeast England: a qualitative participatory evaluation. *Bmj Open*, 8(4), e020930.
- Lallou é B., Jiang, S., Girault, A., Ferrua, M., Loirat, P., & Minvielle, E. (2017). Evaluation of the effects of the French pay-for-performance program-IFAQ pilot study. *Journal of the International Society for Quality in Health Care*, 29(6), 833-837.
- Lawler, E. E. (1971). *Pay and organizational effectiveness: A psychological view*. McGraw-Hill.
- Lesser, C. S., Lucey, C. R., Egener, B., Braddock, C. H., & Levinson, W. (2010). A behavioral and systems view of professionalism. *Jama-Journal of the American Medical Association*, 304(24), 2732-3237.
- Leung, J. G., Owen, A., Webb, A. J., Johnson, E. K., Dively-White, M., & Kreps, M. (2021). Improvement of inpatient psychiatric facility quality reporting program measure: screening for metabolic disorders through pharmacy collaborative practice agreement. *Journal of the American Pharmacists Association*, 61(5), 126-131.
- Leviton, S. A., & Davis, R. C. (1951). The fundamentals of top management. *Psychosomatics*, 6(2), 272.
- Li, B. F. (2006). 论医学专业化 [On Professionalism in Medicine]. *Chinese Medical Ethics*, 19(06), 3-4.
- Li, H. H. (2017). *Construction of the evaluation index system of Chinese clinicians' professionalism and evaluation research* [Doctoral dissertation]. China Medical University.
- Li, L. N., Qi, Y., Zhang, F., Zhao, J. H., Hu, J. S., & Liu, Y. J. (2021). 医学生精神信仰、社会责任与利他行为的关系研究 [Research on the relationship between spiritual belief, social responsibility and altruistic behaviors of medical students]. *China Higher Medical Education*, (2), 39-40.
- Li, X. (2018). 时间预估作业成本核算方法在医院成本核算中的应用研究 [Research on the application of time-estimated job costing method in hospital costing]. *China Accountant*

- General*, (11), 98-100.
- Li, Y. P., Liang, L., & Deng, S. L. (2014). 八年制医学生职业精神状况的评价与结果分析 [Evaluation and result analysis on the professional spirit situation of eight-year program medical students]. *Chinese Journal of Medical Education*, 34(02), 235-238.
- Li, Y., Weng, H., Zhang, M., Zhu, T., Wang, F., & Liu, H. (2022). Congruence in perceived employee-peer overqualification and organizational citizenship behavior. *Journal of Personnel Psychology*, 22(3), 123-135.
- Liang, Y., Wu, H., & Yi, L. X. (2011). 医学生长期职业行为评价指标体系的研究 [Research on the index system for evaluating the professional behavior of medical students in the long schooling]. *Chinese Journal of Medical Education*, (1), 87-90.
- Liao, M. X., He, J. L., & Yang, Y. S. (2020). 美国引入和建立基于价值的肿瘤支付模式 [The introduction and establishment of value-based oncology payments models in the US]. *Chinese Health Economics*, 39(12), 110-113.
- Lin, M. Y., Cheng, L. J., Chiu, Y. W., Hsieh, H. M., Wu, P. H., & Lin, Y. T. (2018). Effect of national pre-ESRD care program on expenditures and mortality in incident dialysis patients: A population-based study. *Plos One*, 13(6), e0198387.
- Liu, J. K., & Chen, T. (2014). 大型房地产公司项目经理薪酬满意度影响因素的实证研究 [Empirical study on influence factors of project manager pay satisfaction in large real estate company]. *Journal of Engineering Management*, 28(06), 145-149.
- Liu, Y. (2017). 医师职业精神的新内涵 [The new connotation of the physician's professional spirit]. *Chinese Health*, (5), 61-65.
- Liu, Y., Liang, L., & Sun, H. (2015). 公立医院薪酬激励的国际经验及其对中国的启示 [International experience of public hospital salary incentive and its enlightenment to China]. *Chinese Hospital Management*, (6), 12-14.
- Lu, H. X., Zhu, L., & Li, X. (2013). 新时代医学职业精神的影响因素及路径重构 [Exploration of influence factors and reconstruction of path for medical occupation spirit during new period]. *Acta Universitatis Medicinalis Nanjing (Social Science)*, 13(03), 255-258.
- Lu, L., & Mao, Y. (2019). 中外医疗专业化研究进展 [Research progress of medical professionalism in China and foreign countries]. *Chinese Medical Ethics*, 32(6), 792-797.
- Lu, Y., Wang, M., & Hu, C. (2019). 南京市公立医院医务人员薪酬水平及满意度研究 [Study on the salary level and satisfaction of medical staff in Nanjing Public hospitals]. *Acta Universitatis Medicinalis Nanjing (Social Science)*, (4), 318-321.
- Lv, C., Bai, F., & Wei, X. F. (2020). 公立医院医师医疗专业实践评估工具的研究 [Research on the assessment tool for physician medical professionalism practices in public hospitals]. *Chinese Hospital Management*, 40(05), 64-66.
- Lv, J. X. (2020). *A study on the current situation and influencing factors of medical students' professionalism behavior in the social media environment* [Master's thesis]. China Medical University.
- Maio, G. (2015). "I do the right thing only against payment": A critique of pay for performance in psychiatry. *Der Nervenarzt*, 86(11), 1349-1357.
- Maslow, A. H. (1943). A theory of human motivation. *Psychol Review*, 50(1), 370.
- Mathes, T., Pieper, D., Morche, J., Polus, S., Jaschinski, T., & Eikermann, M. (2019). Pay-for-performance for hospitals. *The Cochrane Database of Systematic Reviews*, 7(7), CD011156.
- Mayumana, I., Borghi, J., Anselmi, L., Mamdani, M., & Lange, S. (2017). Effects of payment for performance on accountability mechanisms: evidence from Pwani, Tanzania. *Social Science & Medicine* (1982), 179, 61-73.
- McClellan, M. B., & Thoumi, A. I. (2015). Oncology payment reform to achieve real healthcare reform. *Journal of Oncology Practice*, 11(3), 223-230.

- Mendelson, A., Kondo, K., Damberg, C., Low, A., Motúapuaka, M., Freeman, M., & Kansagara, D. (2017). The effects of pay-for-performance programs on health, health care use, and processes of care: a systematic review. *Annals of Internal Medicine*, 166(5), 341-353.
- Meng, X. B., Wang, X. X., & Li, G. (2022). An empirical study on the salary satisfaction of primary and secondary school teachers and their influencing factors in China under the perspective of equity theory -- based on the survey data of China teacher development report 2019. *Modern Education Review*, (1), 75-85.
- Metcalfe, D., Zogg, C. K., Judge, A., Perry, D. C., & Costa, M. L. (2019). Pay for performance and hip fracture outcomes. *The Bone & Joint Journal*, 101(8), 1015-1023.
- Meyer, J. P., & Allen, N. J. (1991). A three-component conceptualization of organizational commitment. *Human Resource Management Review*, 1(1), 61-89.
- Mianda, S., Todowede, O. O., & Schneider, H. (2021). coping review protocol of service delivery-related interventions to improve maternal and newborn health in low-income and middle-income countries. *BMJ Open*, 11(3), e042952.
- Miceli, M. P., & Heneman, R. L. (2000). Contextual determinants of variable pay plan design: a proposed research framework. *Human Resource Management Review*, 10(3), 289-305.
- Middleton, M. (2018). Orthogeriatrics and hip fracture care in the UK: Factors Driving change to more integrated models of care. *Geriatrics (Basel, Switzerland)*, 3(3), 44-55.
- Milstein, R., & Schreyoegg, J. (2016). Pay for performance in the inpatient sector: A review of 34 P4P programs in 14 OECD countries. *Health Policy (Amsterdam, Netherlands)*, 120(10), 1125-1140.
- Minchin, M., Roland, M., Richardson, J., Rowark, S., & Guthrie, B. (2018). Quality of care in the United Kingdom after removal of financial incentives. *The New England Journal of Medicine*, 379(10), 948-957.
- Mitchell, J. M., Hadley, J., Sulmasy, D. P., & Bloche, J. G. (2000). Measuring the effects of managed care on physicians' perceptions of their personal financial incentives. *Inquiry*, 37(2), 134-145.
- Moro Visconti, R., & Morea, D. (2020). Healthcare digitalization and pay-for-performance incentives in smart hospital project financing. *International Journal of Environmental Research and Public Health*, 17(7), 2318.
- Navathe, A. S., Volpp, K. G., Caldarella, K. L., Bond, A., Troxel, A. B., & Zhu, J. (2019). Effect of financial bonus size, loss aversion, and increased social pressure on physician pay-for-performance: a randomized clinical trial and cohort study. *Jama Network Open*, 2(2), e187950.
- Neumann, M., Bensing, J., Wirtz, M., Ansgar, W., Scheffer, C., & Tauschel, D. (2011). The impact of financial incentives on physician empathy: a study from the perspective of patients with private and statutory health insurance. *Patient Education & Counseling*, 84(2), 208-216.
- Norcini, & John, J. (1995). The mini-CEX (clinical evaluation exercise): a preliminary investigation. *Annals of Internal Medicine*, 123(10), 795.
- Norton, E. C., Li, J., Das, A., Ryan, A. M., & Chen, L. M. (2022). Medicare's hospital value-based purchasing program values quality over QALYs. *Medical Decision Making*, 42(1), 51-59.
- Ogundeji, Y. K., Bland, J. M., & Sheldon, T. A. (2016). The effectiveness of payment for performance in health care: A meta-analysis and exploration of variation in outcomes. *Health Policy (Amsterdam, Netherlands)*, 120(10), 1141-1150.
- Omboni, S., Tenti, M., & Coronetti, C. (2019). Physician-pharmacist collaborative practice and telehealth may transform hypertension management. *Journal of Human Hypertension*, 33(3), 177-187.
- Os, B. V. (2001). Dynamic programming for partitioning in multivariate data analysis.

- Compstat*, 4(4), 561-569.
- Parker, J. C. (2011). Cherry picking in ESRD: an ethical challenge in the era of pay for performance. *Seminars in Dialysis*, 24(1), 5–8.
- Parsa-Parsi, R. W. (2017). The revised declaration of Geneva: A modern-day physician's pledge. *Jama-Journal of the American Medical Association*, 318(20), 1971-1972.
- Pollock, B. D., & Dowdy, S. C. (2023). Hospital quality reporting in the pandemic era: to what extent did hospitals' COVID-19 census burdens impact 30-day mortality among non-COVID Medicare beneficiaries? *BMJ Open Quality*, 12(1), e002269.
- Porter, L. W., & Lawler, E. E. (1968). *Management attitudes and performance*. Richard D. Irwin Company.
- Pourat, N., & Kominski, G. (2019). An assessment of pay for performance under California's delivery system reform incentive payment program. *Population Health Management*, 23(2), 157-164.
- Project, M. P. (2002). Charter on medical professionalism: medical professionalism in the new millennium: a physicians' charter. *Lancet*, 359(9305), 520-522.
- Pronovost, P. J., Armstrong, C. M., Demski, R., Callender, T., Winner, L., & Rothman, P. B. (2015). Creating a high-reliability health care system: improving performance on core processes of care at Johns Hopkins Medicine. *Academic Medicine*, 90(2), 165-172.
- Pu, F., & Guo, X. N. (2008). An analysis of the compensation incentive mechanism for project managers in private real estate enterprises. *Business China*, 9, 159-160.
- Pyo, J., Lee, W., Choi, E. Y., Jang, S. G., & Ock, M. (2023). Qualitative research in healthcare: necessity and characteristics. *Journal of Preventive Medicine and Public Health*, 56(1), 12-20.
- Qu, F., & Wang, L. Y. (2010). On the consistency of “Wu Chang” thought in Confucian doctrines and doctor's professionalism. *Chinese Medical Ethics*, 23(002), 39-40.
- Resnick, M. J. (2019). Review: quality of care in the United Kingdom after removal of financial incentives. *The Journal of Urology*, 201(4), 656-657.
- Richter, A. W., Hirst, G., & Van Knippenberg, D. (2012). Creative self-efficacy and individual creativity in team contexts: cross- level interactions with team informational resources. *Journal of Applied Psychology*, 97(6), 1282-1290.
- Roberts, E. T., Zaslavsky, A. M., & McWilliams, J. M. (2018). The value-based payment modifier: program outcomes and implications for disparities. *Annals of Internal Medicine*, 168(4), 255-265.
- Roland, M. (2004). Linking physicians' pay to the quality of care--a major experiment in the United Kingdom. *The New England Journal of Medicine*, 351(14), 1448-1454.
- Roland, M. (2006). Pay-for-performance: too much of a good thing? A conversation with Martin Roland. Interview by Robert Galvin. *Health Affairs (Project Hope)*, 25(5), 412-419.
- Roland, M., Rao, S. R., & Sibbald, B. (2011). Professional values and reported behaviours of doctors in the USA and UK: quantitative survey. *BMJ Quality & Safety*, 20(6), 515-521.
- Roman, S. H., & Major, C. E. (2022). Value-Based Purchasing Programs (VBPs): Are the quality measures used "fit for purpose"? *American Journal of Medical Quality*, 37(2), 160-165.
- Rong, X., Wu, J., Lin, Q., & Fu, M. (2023). 四川省三级公立医院护士薪酬满意度与薪酬公平感的相关性研究 [Study on the correlation between nurse salary satisfaction and sense of pay fairness in tertiary public hospitals in Sichuan Province]. *Smart Health*, (4), 151-156.
- Rousseau, D., Manning, J., & Denyer, D. (2008). Evidence in management and organizational science: assembling the field's full weight of scientific knowledge through syntheses. *Academy of Management Annals*, 2(1), 475-515.
- Rowe J. W. (2006). Pay-for-performance and accountability: Related themes in improving

- health care. *Annals of Internal Medicine*, 145(9), 695–699.
- Ryan, A. M. (2009). Effects of the premier hospital quality incentive demonstration on medicare patient mortality and cost. *Health Services Research*, 44(3), 821-842.
- Ryan, A. M., Blustein, J., & Casalino, L. P. (2012). Medicare's flagship test of pay-for-performance did not spur more rapid quality improvement among low-performing hospitals. *Health Affairs (Project Hope)*, 31(4), 797-805.
- Ryan, A. M., Burgess, J. F., Pesko, M. F., Borden, W. B., & Dimick, J. B. (2015). The early effects of Medicare's mandatory hospital pay-for-performance program. *Health Services Research*, 50(1), 81-97.
- Saint-Lary, O., Bernard, E., Sicsic, J., Plu, I., François-Purcell, I., & Franc, C. (2013). Why did most French GPs choose not to join the voluntary national pay-for-performance program? *Plos One*, 8(9), e72684.
- Scott, A., Sivey, P., Ait Ouakrim, D., Willenberg, L., Naccarella, L., Furler, J., & Young, D. (2011). The effect of financial incentives on the quality of health care provided by primary care physicians. *The Cochrane Database of Systematic Reviews*, 9, CD008451.
- Shi, L. (2018). *Research of the relationship between physician professionalism and professional practice environment* [Master's thesis]. Dalian Medical University.
- Shore, T. H., Tashchian, A., & Jourdan, L. (2006). Effects of internal and external pay comparisons on work attitudes. *Journal of Applied Social Psychology*, 36(10), 2578-2598.
- Shu, M. (2021). *The relationship between perceived organizational support and professionalism of clinicians* [Doctoral dissertation]. Huazhong University of Science and Technology.
- Siddiqui, I., Remington, G., Fervaha, G., Fletcher, P. J., Voineskos, A. N., & Saperia, S. (2018). Objective investigation of activity preference in schizophrenia: A pilot study. *Psychiatry Research*, 267, 551-559.
- Siriwardena, A. N. (2012). Research on the UK Quality and Outcomes Framework (QOF) and answering wider questions on the effectiveness of pay-for-performance (P4P) in health care. *Quality in primary Care*, 20(2), 81–82.
- Skinner, B. F. (1963). Operant behavior. *American Psychologist*, 18(8), 503-515.
- Stone, P. W., Adamson, A., Hurst, J. R., Roberts, C. M., & Quint, J. K. (2022). Does pay-for-performance improve patient outcomes in acute exacerbation of COPD admissions? *Thorax*, 77(3), 239-246.
- Sun, F. (2006). 伦理精神：医学职业精神阐释的核心话语及其重构 [Ethical spirit: the core discourse of medical professional spirit interpretation and its reconstruction]. *Chinese Medical Ethics*, 19(6), 13-17.
- Sun, Y. (2015). 社会认知理论视角下医生职业行为研究的制约和突破 [The restriction and breakthrough of physician professional behavior study based on a new perspective of social cognitive theory]. *Chinese Hospital Management*, 35(12), 100-102.
- Swick, H. M. (2000). Toward a normative definition of medical professionalism. *Academic Medicine*, 75(6), 612-616.
- Tan, Y. (2017). *Department climate and its impact on clinical physician's medical professional attitudes and behaviors in four public hospitals, China* [Master's thesis]. Huazhong University of Science and Technology.
- The Lancet. (2021). Medical professionalism and physician wellbeing. *Lancet (London, England)*, 398(10303), 817.
- Tim, D., & Catherine, F. (2007). Pay-for-performance: is it the best way to improve control of hypertension? *Current Hypertension Reports*, 9(5), 360-367.
- Tong, P. H., & Zhao, D. Z. (2018). The impact of corporate social responsibility on employee internal working motivation. *Journal of Technical Economics & Management*, (11), 60-64.
- Toppen, J. T. (1965). Effect of size and frequency of money reinforcement on human operant

- (work) behavior. *Perceptual and Motor Skills*, 20, 259-269.
- Tottrup, C., Tersbol, B. P., Lindeboom, W., & Meyrowitsch, D. (2009). Putting child mortality on a map: towards an understanding of inequity in health. *Tropical Medicine & International Health*, 14(6), 653-662.
- Veloski, J. J., Fields, S. K., Boex, J. R., & Blank, L. L. (2005). Measuring professionalism: a review of studies with instruments reported in the literature between 1982 and 2002. *Academic Medicine*, 80(4), 366-370.
- Viganego, F., Um, E. K., Ruffin, J., Fradley, M. G., Prida, X., & Friebe, R. (2021). Impact of global budget payments on cardiovascular care in Maryland: an interrupted time series analysis. *Circulation. Cardiovascular Quality and Outcomes*, 14(3), e007110.
- Vroom, V. H. (1964). *Work and motivation*. Wiley.
- Walsh, E. (2011). Conceptualizing physician professionalism. *Jama-Journal of the American Medical Association*, 305(14), 1411-1413.
- Wan, H., Liang, J. C., & Kong, M. Y. (2010). 建筑施工企业员工特征与薪酬满意度关系的实证研究 [Empirical study on the relationship between staffs characteristics and satisfaction to the pay in construction company]. *Technology Economics*, 29(8), 116-121.
- Wang, C. (2018). *Value-based healthcare delivery in China: an exploratory study* [Doctoral dissertation]. Institute University of de Lisbon.
- Wang, H., & Min, R. (2019). 基于我国行业特点的公立医院薪酬制度思考与分析 [Thinking and analysis of the salary system in public hospitals based on the characteristics of Chinese industry]. *Chinese Hospital Management*, (5), 48-50.
- Wang, Y., & Hou, J. (2015). 我国公立医院薪酬制度存在的问题及改革建议 [Problems existing in the salary system of public hospitals in China and their reform suggestions]. *Chinese Health Economics*, (1), 5-8.
- Ward, J. C., Bourbeau, B., & Chin, A. L. (2020). Updates to the ASCO patient-centered oncology payment model. *Jco Oncology Practice*, 16(5), 263-269.
- Waterfield, D., & Barnason, S. (2022). The integration of care ethics and nursing workload: A qualitative systematic review. *Journal of Nursing Management*, 30(7), 2194-2206.
- Wiesing, U., & Parsa-Parsi, R. (2016). The world medical association launches a revision of the declaration of Geneva. *Bioethics*, 30(3), 140-148.
- Wijisenbeek, M. S., Moor, C. C., Johansson, K. A., Jackson, P. D., Khor, Y. H., & Kondoh, Y. (2023). Home monitoring in interstitial lung diseases. *The Lancet*, 11(1), 97-110.
- Wilkinson, T. J., Wade, W. B., & Knock, L. D. (2009). A blueprint to assess professionalism: results of a systematic review. *Academic Medicine*, 84(5), 551-558.
- Williams, M. L., McDaniel, M. A., & Nguyen, N. T. (2006). A meta-analysis of the antecedents and consequences of pay level satisfaction. *The Journal of Applied Psychology*, 91(2), 392-413.
- Wu, X. Y., Wang, C. X., & Zhang, X. J. (2006). 酒店员工薪酬满意度影响因素的实证研究 [An empirical study of the influential factors of hotel employee's pay satisfaction]. *Tourism Science*, 20(2), 72-78.
- Wu, Y. P., Qiu, J., Yang, Q. X., & Feng, S. (2019). 我国公立医院临床医生专业化现状调查 [A survey on the current status of clinicians' professionalism in China's public hospitals]. *Chinese Journal of Hospital Administration*, (6), 482-486.
- Wynia, M. K. (2009). The risks of rewards in health care: how pay-for-performance could threaten, or bolster, medical professionalism. *Journal of General Internal Medicine*, 24(7), 884-887.
- Xie, K. (2016). 中国医师职业精神的十年回顾与展望——第十届中美医师职业精神研讨会侧记 [Ten years review and prospect of Chinese doctors' professionalism: side notes of the 10th Chinese-American Doctor Professionalism Seminar]. *Medicine and Philosophy*,

- 37(3A), 95-98.
- Xu, X., & Yuan, H. Y. (2016). 医师职业精神评价指标体系构建研究--以上海市8所三级甲等医院为例 [Research on the construction of evaluation index system for physician professionalism——based on 8 three-a hospitals in Shanghai]. *Chinese Medical Ethics*, 29(002), 195-198.
- Yang, X. X., & Fu, J. T. (2019). 绩效薪酬满意度对组织承诺的影响研究 [A study of the effect of performance pay satisfaction on organizational commitment]. *Marketing Management Garden*, 6(1), 2.
- Ye, F., Li, J., & Liu, J. (2008). 医师职业素养的调查与分析 [Survey and analysis of physician's acknowledge of professionalism]. *Journal of Sounthwest Minzu University (Nature Science Edition)*, 34(06), 1269-1271.
- Yu, D. H., Li, J. G., & Xu, S. Z. (2013). 医学专业化内在驱动力的实证分析 [Empirical analysis of internal driving force of medical professionalism]. *Chinese Hospital Management*, 33(01), 54-57.
- Yue, S., Chen, J., & Jiang, G. (2018). 北京某医院住院医师职业精神认知的调查研究 [Study on the professional spirit cognition of resident doctors in a hospital in Beijing]. *China Continuing Medical Education*, 10(10), 8-11.
- Zeng, W., Ma, S., He, J., & Wang, C. (2019). 该如何帮助医生:基于离职倾向和职业承诺的相关研究 [How to help doctors? Related studies based on turnover tendency and occupational commitment]. University of Electronic Science and Technology of China Press.
- Zhang, R. (2017). *Patient-oriented public hospital culture and its influence on physician's medical professionalism* [Master's thesis]. Huazhong University of Science and Technology.
- Zhao, L., & Lu, C. (2017). 2017版《日内瓦宣言》的修订及其意义分析 [The revision of the 2017 edition of the Geneva Declaration and its significance analysis]. *Chinese Medical Ethics*, 30(11), 1439-1442.
- Zhao, W. Y. (2018). *The qualitative and quantitative research on the present situation of medical student's professionalism dilemmas* [Master's thesis]. China Medical University.
- Zhou, Z. X. (2014). *Theoretical and empirical study on relationship between pay satisfaction and medical professionalism* [Doctoral dissertation]. Shandong University.
- Zhou, Z. X., Rong, H. G., & Chen, X. Y. (2013). 制度伦理视野下医学专业化制度化建设的伦理原则及其现实意义 [Ethical principles and practical significance of medical professionalism institutionalized construction under institutional ethics sight]. *Henan Social Sciences*, 21(10), 52-54.
- Zweifel, P., & Janus, K. (2017a). Medical ethics: enhanced or undermined by modes of payment? *The European Journal of Health Economics*, 18(1), 119-129.
- Zweifel, P., & Janus, K. (2017b). Reply to commentary on: medical ethics: enhanced or undermined by modes of payment. *The European Journal of Health Economics*, 18(1), 133-134.

Webliography

- Centers for Medicare and Medicaid Services. (2020, July 16). *Oncology Care Model*. CMS Gov. Retrieved May 1, 2022, from <https://www.cms.gov/priorities/innovation/innovation-models/oncology-care>
- Locke, E., & Latham, G. P. (2011, September 12). *What should we do about motivation theory? Six recommendations for the twenty-first century*. Mendeley. Retrieved June 19, 2022, from <http://www.mendeley.com/research/what-should-we-do-about-motivation-theory-six-recommendations-for-the-twentyfirst-century-2/>

[This page is deliberately left blank.]

Annex A: Questionnaire Survey of Physician Professionalism Scale

Dear Interviewee,

Thank you for participating in our survey. The data collected in this questionnaire is for research purposes only. Our statistical analysis is based on the combined results of all questionnaires and no individual data is analyzed and stored. Therefore, please answer all questions based on your personal experience and true feelings. This questionnaire consists of two parts: 1) demographic information and 2) respondents' evaluation. It takes about 20 minutes to complete the questionnaire. Thank you very much for your support and help for this research.

Name of hospital: _____ Questionnaire date: _____

Part I: Demographic information

Please provide the following demographic information.

a. Gender: Male _____; Female _____

b. Age: _____

c. Educational level:

_____Doctorate _____Master _____Bachelor _____Junior college and below

d. Working hours in the hospital : _____

e. Department: _____Internal medicine _____Surgery _____Gynecology and obstetrics

_____Pediatrics _____Emergency department

f. Title: _____Resident physician _____Attending physician

_____Deputy chief physician _____Chief physician

Part II: Respondents' evaluation

Choose and circle a number to indicate how strongly you agree with each of the following statements (1 for disagree, 5 for agree). There is no objective answer or scoring standard. Judge and estimate based on your experience, feelings, and observations. Please answer all the

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

questions.

Dimensions	Entries					
Connotation	Q1. Physicians should inform patients of the pros and cons and risks of treatment options.	1	2	3	4	5
	Q2. Physicians should seek truth from facts and not mislead patients to make unreasonable medical choices.	1	2	3	4	5
	Q3. Physicians should keep the patient's condition, personal privacy confidential.	1	2	3	4	5
	Q4. Physicians should put patients' interests above their personal interests.	1	2	3	4	5
	Q5. Physicians should provide basic medical services regardless of the patient's ability to pay.	1	2	3	4	5
Historical development	Q6. Physicians should follow guidelines for diagnosis, treatment and drug use, and carry out reasonable examination, treatment and drug use.	1	2	3	4	5
	Q7. Physicians should continuously update and improve their knowledge and skills.	1	2	3	4	5
	Q8. Physicians should use critical thinking to learn or apply new knowledge and technology.	1	2	3	4	5
	Q9. Physicians should integrate traditional and new therapies to provide valuable diagnosis and treatment services.	1	2	3	4	5
Medical practice of physician professionalism	Q10. Physicians should strive to improve the quality of medical care.	1	2	3	4	5
	Q11. Physicians should be involved in the evaluation of the quality of medical care provided by their colleagues.	1	2	3	4	5
	Q12. Physicians should proactively report their own adverse medical events.	1	2	3	4	5
	Q13. Physicians should report incompetent colleagues to their leaders or relevant departments.	1	2	3	4	5
Cultivation and inheritance	Q14. Physicians should make health knowledge popular among the communities in an accessible manner.	1	2	3	4	5
	Q15. Physicians should evaluate their colleagues' professional abilities and personal qualities fairly and objectively.	1	2	3	4	5
	Q16. Physicians should not denigrate one another or inappropriately impede patients' trust in their peers.	1	2	3	4	5
	Q17. When personal skills are limited, physicians should consult with colleagues or seek help to get a reasonable treatment plan.	1	2	3	4	5
Medical and social value	Q18. In medical services, physicians should not discriminate between patients because of wealth, status, gender, ethnicity and other reasons.	1	2	3	4	5
	Q19. For patients with financial difficulties, physicians should try to choose cost-effective treatment options.	1	2	3	4	5
	Q20. Physicians should not accept property, kickbacks and other improper benefits given by pharmaceutical enterprises or personnel.	1	2	3	4	5
	Q21. Physicians should provide comprehensive medical services and health guidance to patients.	1	2	3	4	5

Annex B: Questionnaire Survey of Physician Occupational Commitment Scale

Dear Interviewee,

Thank you for participating in our survey. The data collected in this questionnaire is for research purposes only. Our statistical analysis is based on the combined results of all questionnaires and no individual data is analyzed and stored. Therefore, please answer all questions based on your personal experience and true feelings. This questionnaire consists of two parts: 1) demographic information and 2) respondents' evaluation. It takes about 20 minutes to complete the questionnaire. Thank you very much for your support and help for this research.

Name of hospital: _____ Questionnaire date: _____

Part I: Demographic information

Please provide the following demographic information.

a. Gender: Male _____; Female _____

b. Age: _____

c. Educational level:

_____ Doctorate _____ Master _____ Bachelor _____ Junior college and below

d. Working hours in the hospital : _____

e. Department: _____ Internal medicine _____ Surgery _____ Gynecology and obstetrics

_____ Pediatrics _____ Emergency department

f. Title: _____ Resident physician _____ Attending physician

_____ Deputy chief physician _____ Chief physician

Part II: Respondents' evaluation

Choose and circle a number to indicate how strongly you agree with each of the following statements (1 for disagree, 5 for agree). There is no objective answer or scoring standard. Judge and estimate based on your experience, feelings, and observations. Please answer all the

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

questions.

Scale	Entries					
Physician occupational commitment scale	Q1. Being a physician makes me pleasant.	1	2	3	4	5
	Q2. I'm proud to work in the medical field.	1	2	3	4	5
	Q3. I am happy to be a physician.	1	2	3	4	5
	Q4. I identify with the profession of physician very much.	1	2	3	4	5
	Q5. I am passionate about being a physician.	1	2	3	4	5
	Q6. Being a physician is important to my self-image.	1	2	3	4	5

Annex C: Questionnaire Survey on Hospital PFPS Scale and Physician Professionalism Scale

Dear Interviewee,

Thank you for participating in our survey. The data collected in this questionnaire is for research purposes only. Our statistical analysis is based on the combined results of all questionnaires and no individual data is analyzed and stored. Therefore, please answer all questions based on your personal experience and true feelings. This questionnaire consists of two parts: 1) demographic information and 2) performance-pay ratio; 3) working condition; 4) respondents' evaluation to hospital PFPS scale. It takes about 20 minutes to complete the questionnaire. Thank you very much for your support and help for this research.

Name of hospital: _____ Questionnaire date: _____

Part I: Demographic information

Please provide the following demographic information.

a. Gender: Male _____; Female _____

b. Age: _____

c. Educational level:

_____Doctorate _____Master _____Bachelor _____Junior college and below

d. Working hours in the hospital : _____

e. Department: _____Internal medicine _____Surgery _____Gynecology and obstetrics

_____Pediatrics _____Emergency department

f. Title: _____Resident physician _____Attending physician

_____Deputy chief physician _____Chief physician

Part II: Performance-pay ratio

Please write down your performance-pay ratio: _____

Part III: Working condition

- a. Average sleep time per day: _____ hour (s)
- b. Average number of overtime work: _____ time (s)
- c. Average number of night shifts per month: _____ (times)

Part IV: Respondents' evaluation to hospital PFPS scale

Choose and circle a number to indicate how strongly you agree with each of the following statements (1 for disagree, 5 for agree). There is no objective answer or scoring standard. Judge and estimate based on your experience, feelings, and observations. Please answer all the questions.

Dimensions	Items	1	2	3	4	5
Overall level	Q1. Your satisfaction with your current gross income.	1	2	3	4	5
	Q2. Your satisfaction with your actual salary after tax.	1	2	3	4	5
	Q3. Your satisfaction with the total amount of current pay-for-performance of yourself.	1	2	3	4	5
	Q4. Your satisfaction with the number of pay-for-performance programs.	1	2	3	4	5
Salary increase	Q5. Your satisfaction with the amount of welfare you receive.	1	2	3	4	5
	Q6. Your opinion on the composition of the hospital's welfare program.	1	2	3	4	5
	Q7. Your satisfaction with the value of the welfare you receive	1	2	3	4	5
	Q8. Your satisfaction with the number of welfare programs you benefit from.	1	2	3	4	5
Salary management	Q9. Your feelings about your average amount of historical salary increase.	1	2	3	4	5
	Q10. Your feelings about your most recent salary performance pay increase.	1	2	3	4	5
	Q11. Your opinion on the policies that determine your salary increase.	1	2	3	4	5
	Q12. Your feelings about the impact of your supervisor(s) on your salary increase.	1	2	3	4	5
Welfare	Q13. Your opinion on the hospital's pay policy system.	1	2	3	4	5
	Q14. Your opinion on the openness of the hospital's salary.	1	2	3	4	5
	Q15. Your opinion on pays of other positions in the hospital.	1	2	3	4	5
	Q16. Your opinion on the fairness of the hospital's pay policy.	1	2	3	4	5
	Q17. Your opinion on the pay difference of different positions in the hospital.	1	2	3	4	5

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Q18. Your opinion on hospital's salary management.	1	2	3	4	5
--	---	---	---	---	---

Part IV: Respondents' evaluation to physician professionalism scale

Choose and circle a number to indicate how strongly you agree with each of the following statements (1 for disagree, 5 for agree). There is no objective answer or scoring standard. Judge and estimate based on your experience, feelings, and observations. Please answer all the questions.

Dimensions	Items	1	2	3	4	5
Connotation	Q1. Physicians should inform patients of the pros and cons and risks of treatment options.	1	2	3	4	5
	Q2. Physicians should seek truth from facts and not mislead patients to make unreasonable medical choices.	1	2	3	4	5
	Q3. Physicians should keep the patient's condition, personal privacy confidential.	1	2	3	4	5
	Q4. Physicians should put patients' interests above their personal interests.	1	2	3	4	5
	Q5. Physicians should provide basic medical services regardless of the patient's ability to pay.	1	2	3	4	5
Historical development	Q6. Physicians should follow guidelines for diagnosis, treatment and medication, and carry out reasonable examination, treatment and medication.	1	2	3	4	5
	Q7. Physicians should continuously update and improve their knowledge and skills.	1	2	3	4	5
	Q8. Physicians should use critical thinking to learn or apply new knowledge and technology.	1	2	3	4	5
	Q9. Physicians should integrate traditional and new therapies to provide valuable diagnosis and treatment services.	1	2	3	4	5
Medical practice	Q10. Physicians should strive to improve the quality of medical care.	1	2	3	4	5
	Q11. Physicians should be involved in the evaluation of the quality of medical care provided by their colleagues.	1	2	3	4	5
	Q12. Physicians should proactively report their own adverse medical events.	1	2	3	4	5
	Q13. Physicians should report incompetent colleagues to their leaders or relevant departments.	1	2	3	4	5
Cultivation and inheritance	Q14. Physicians should disseminate health knowledge should be to the community in an accessible manner.	1	2	3	4	5
	Q15. Physicians should evaluate their colleagues' professional abilities and personal qualities fairly and objectively.	1	2	3	4	5
	Q16. Physicians should not denigrate one another or inappropriately impede patients' trust in their peers.	1	2	3	4	5
	Q17. When personal skills are limited, physicians should consult with colleagues or seek help to get a reasonable treatment plan.	1	2	3	4	5
Medical and social value	Q18. In medical services, physicians should not discriminate between patients because of wealth, status,	1	2	3	4	5

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

gender, ethnicity and other reasons.					
Q19. For patients with financial difficulties, physicians should try to choose cost-effective treatment options.	1	2	3	4	5
Q20. Physicians should provide comprehensive medical services and health guidance to patients.	1	2	3	4	5

Annex D: Open Interviews

Dear Interviewee,

Thank you for participating in our survey. The data collected in this questionnaire is for research purposes only. Our statistical analysis is based on the combined results of all questionnaires and no individual data is analyzed and stored. Therefore, please answer all questions based on your personal experience and true feelings. If there are any questions about understanding the topic, please feel free to communicate with the interviewer. This questionnaire consists of 11 open interview topics, which may take about 20 minutes to complete. Thank you very much for your support and help for this research.

Name: _____ Highest title: _____ Highest degree: _____

Name of hospital: _____ Questionnaire date: _____

(1) Please talk about how to improve the quality of medical services based on the framework of PFP and physician professionalism.

(2) Please talk about how to improve physicians' professional ability based on the framework of PFP and physician professionalism.

(3) Please talk about how to be honest with patients based on the framework of PFP and physician professionalism.

(4) Please talk about how to keep confidentiality with patients based on the framework of PFP and physician professionalism.

(5) Please talk about how to effectively promote medical services sharing among patients based on the framework of PFP and physician professionalism.

(6) Please talk about how to allocate the limited medical resources fairly based on the framework of PFP and physician professionalism.

(7) Please talk about how physicians can be responsible for scientific knowledge based on the framework of PFP and physician professionalism.

(8) Please talk about how physicians can be accountable to their responsibilities based on the framework of PFP and physician professionalism.

(9) Please talk about your views on the interests of patients first based on the framework of PFP and physician professionalism.

(10) Please talk about how to maintain trust by resolving conflicts of interest based on the framework of PFP and physician professionalism.

(11) Please talk about the impact of PFP on medical outcomes based on the framework of PFP and physician professionalism.

Annex E: Expert Information Sheet of Open Interviews

Num ber	Working unit	Title	Time of interview	Interview method
E1	SanMing First Hospital	Chief physician	November 10, 2023	Face-to-face
E2	SanMing First Hospital	Chief physician	November 11, 2023	Face-to-face
E3	SanMing First Hospital	Chief physician	November 13, 2023	Face-to-face
E4	SanMing First Hospital	Chief physician	November 17, 2023	Face-to-face
E5	SanMing First Hospital	Chief physician	November 17, 2023	Face-to-face
E6	SanMing First Hospital	Chief physician	November 17, 2023	Face-to-face
E7	SanMing First Hospital	Chief physician	November 18, 2023	Face-to-face
E8	SanMing First Hospital	Deputy chief physician	November 18, 2023	Face-to-face
E9	SanMing First Hospital	Deputy chief physician	November 18, 2023	Face-to-face
E10	SanMing First Hospital	Chief physician	November 25, 2023	Face-to-face
E11	SanMing First Hospital	Chief physician	November 25, 2023	Face-to-face
E12	SanMing First Hospital	Deputy chief physician	November 25, 2023	Face-to-face
E13	Sanming Integrated Medicine Hospital	Chief physician	November 25, 2023	Face-to-face
E14	Sanming Integrated Medicine Hospital	Chief physician	November 27, 2023	Face-to-face
E15	Sanming Integrated Medicine Hospital	Deputy chief physician	November 27, 2023	Face-to-face
E16	Sanming Integrated Medicine Hospital	Chief physician	November 27, 2023	Face-to-face
E17	Sanming Integrated Medicine Hospital	Deputy chief physician	December 1, 2023	Face-to-face
E18	Sanming Integrated Medicine Hospital	Deputy chief physician	December 1, 2023	Face-to-face
E19	Sanming Integrated Medicine Hospital	Attending physician	December 1, 2023	Face-to-face
E20	Sanming Integrated Medicine Hospital	Attending physician	December 12, 2023	Face-to-face
E21	Sanming Integrated Medicine Hospital	Attending physician	December 12, 2023	Face-to-face
E22	Sanming Integrated Medicine Hospital	Chief physician	December 12, 2023	Face-to-face
E23	Sanming Integrated Medicine Hospital	Deputy chief physician	January 3, 2024	Face-to-face
E24	Sanming Integrated Medicine Hospital	Master's supervisor	January 4, 2024	Face-to-face
E25	Sanming Integrated Medicine Hospital	Master's supervisor	January 5, 2024	Face-to-face

[This page is deliberately left blank.]

Annex F: Relevant Tables

Table f.1 Regression results for age, title, work experience, performance pay ratio, and monthly night shifts interaction models

Variable	Group	Model 4- 2 β (SE)	Model 4- 4 β (SE)	Model 4- 5 β (SE)	Model 4- 7 β (SE)	Model 4- 9 β (SE)
Pay Performance Satisfaction		0.312* (0.082)	0.321* (0.072)	0.363* (0.072)	0.164* (0.054)	0.353* (0.112)
Age	31-40	-0.122 (0.100)				
	41-50	-0.273* (0.112)				
	51-60	-0.144 (0.173)				
	61 and above	-0.164 (0.542)				
Title	Mid-level		-0.154* (0.092)			
	Associate Senior		-0.274* (0.112)			
	Senior		-0.233* (0.112)			
Work Experience	6-15 years			-0.403* (0.112)		
	16-25 years			-0.384* (0.132)		
	26-35 years			-0.193 (0.192)		
	36 years and above			-0.234 (0.201)		
Interaction: Performance Pay Ratio	<20%					
	20-50%				-0.012 (0.112)	
	51-60%				0.314* (0.153)	
	61-80%				-0.032 (0.121)	
	81% and above				0.052 (0.132)	
Interaction: Monthly Night Shifts	2 or fewer					-0.292 (0.181)
	2-3 times					-0.503* (0.192)
	3 or more times					-0.164 (0.121)

Relationship Between Pay-for-Performance Satisfaction and Physician Professionalism:
Evidence from Public Hospitals in Sanming City of China's Fujian Province

Variable	Group	Model 4-2 β (SE)	Model 4-4 β (SE)	Model 4-5 β (SE)	Model 4-7 β (SE)	Model 4-9 β (SE)
Adj-R ²		0.100	0.100	0.131	0.100	0.112

Note: * $P < 0.050$