Role of remote extension management based on Roy's adaptive theory for secondary prevention in patients with coronary heart disease

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【 **Abstract** 】 Objective: To construct and evaluate the application effectiveness of remote extension management for coronary heart disease under Roy's adaptive theory field of view. Methods: The enrolled 210 eligible CHD patients were divided into two groups (experimental and control)according to a randomized double-blind approach, in which both groups received standardized treatment and care during hospital, based on the fact that the control group (n=105)received routine discharge instructions from responsible nurses and routine out of hospital health while the experimental group (n=105)was supported by Roy's adaptive theory, Rational multimodal CHD long-term management model was constructed with team collaboration. The continuous follow-up observation was conducted for 1 year, and the rates of readmission, major adverse cardiovascular events, and complications after 1 year of discharge in both groups were recorded and observed, and the quality of life, self-health management status of the patients in both groups were tracked and evaluated using the Seattle Angina survey scale specific for coronary heart disease, the coronary self management behavior scale. Results: The rates of rehospitalization with recurrent coronary heart disease, major adverse cardiovascular events, and complications in the experimental group at out of hospital (after 1 year)were significantly lower than those in the control group (P<0. 05;Meanwhile, the scores of each factor and the total score of Seattle Angina survey scale and coronary self management behavior scale in the two groups were significantly different (P<0. 05), and the quality of life and self-management behavior of the experimental group were better than those of the control group. Conclusions: Remote extension management based on Roy's adaptive theory is an effective method for innovative long-term management of CHD and has great application to normalize the effectiveness of out of hospital secondary prevention strategies for CHD.

【 **Key words** 】 Roy adaptive theory;Multimodal extension administration;Coronary heart disease;Secondary prevention

Evidence based medical evidence confirms that high-quality secondary prevention of coronary heart disease can delay and/or reverse the process of coronary atherosclerosis and prevent the occurrence of cardiovascular adverse events after PCI[1]. For patients with coronary heart disease, the implementation of a series of continuous nursing plans to ensure the improvement of the secondary prevention effect outside the hospital is extremely critical. However, most of the existing long-term extended management schemes for coronary heart

disease remain in the development of remote monitoring of medical resources, and the multi-agent optimization task in telemedicine has not formed a mature supporting method. "Roy's adaptive theory"was put forward by Roy, an American nursing expert. This concept is based on the overall needs of the patient's body and mind, and emphasizes the appropriate adjustment of the individual's adaptive ability and ruminant meditation level[2]. This theory is a new theory in the overall health management of the medical system and the promotion of the adaptability of patients with chronic diseases. It has the essence of forward-looking group prevention and health care. This study applies this theory to the remote extended management of coronary heart disease. This paper will study the management characteristics and application effects, aiming to help improve the long-term management and upgrading of coronary heart disease. The specific report is as follows:

1 Data and methods

1.1 Case data

Using the cluster sampling method, 210 patients with coronary heart disease who were treated in the Department of Cardiology and Geriatrics of the Affiliated Hospital of Inner Mongolia Medical University from October 2019 to February 2021 were selected as the study subjects, including 126 males and 84 females, aged 45 to 80 years, with an average age of (59. 3±10. 5)years and a body mass index of (22.8±3. 5)kg/m2.

1.2 Research methods

1.2.1 Grouping

The above 210 selected subjects were randomly divided into two groups according to the double-blind principle, namely, the experimental group (n=105 cases)and the control group (n=105 cases). Both groups received standardized treatment and nursing during the hospital period. On this basis, the control group received the routine discharge guidance of the responsible nurse and routine out-of-hospital health. The experimental group was supported by Roy's adaptive theory and built a reasonable long-term management model of remote coronary heart disease under team cooperation. The demographic data, coronary heart disease type and course of disease and other general data of the two groups were compared, and the difference was not statistically significant (P>0. 05), which was comparable.

1.2.2 Remote extended management strategy of coronary heart disease in the perspective of Roy's adaptive theory

1.2.2.1 System construction and organization preparation

With the goal of"providing long-term care, rehabilitation support and health education for patients with coronary heart disease", according to the characteristics of the standard secondary prevention task of coronary heart disease, and taking the project time as the framework, build a remote extended management system of coronary heart disease under the framework of Roy's adaptive theory and make good organizational preparations.

1.2.2. 2 Remote extension management task process supported by Roy's adaptive theory

①When the patient is discharged from the hospital, the responsible nurse will issue the discharge manual and give detailed discharge guidance such as medication, self-inspection and reexamination, and explain the

management plan of coronary heart disease in the community and at home;Improve the patient file information on the chronic disease management network platform, register the personal account of the network platform for the patient, explain the function module of the platform, and make the patient or family familiar with the health education class and telemedicine arrangement. ②The patient or family member is required to log in to the program interface regularly or irregularly, and the responsible nurse is required to log in to the network platform regularly to verify the patient's condition, and check and verify the patient's various independent physical examination values (such as blood pressure, heart rate, blood sugar, blood lipids, daily urine volume, BMI, etc.). Randomly and regularly carry out online coronary heart disease awareness education courses and patient club exchanges to answer patients'questions, so as to facilitate the summary of patients'self-disease management experience and the sharing of patients'experience;In addition, the follow-up records of the patients were randomly fed back to the family caregivers to urge their family caregiver status to assist the patients in home self-management.

1.2.2.3 Evidence-based practice intervention of Roy's adaptive theory

In remote extended management, according to Roy's adaptive theory, we can reasonably establish nurse-patient communication and trust according to four ways of individual adaptation adjustment, namely, physiological/physical way, self-concept/group identity way, role function way, and interdependence way, so that patients can better participate in management actions. Specifically, in the early stage, it is mainly combined with the group disease symptoms and psychological state at the time of discharge to find out the patient's earliest change and the most sensitive self-concept awareness. Through communication with the patient, it can help the patient master the basic knowledge of the secondary prevention and intervention mechanism of coronary heart disease and the home-based treatment plan in the way of group identity, improve the self-concept awareness of rehabilitation treatment, and provide a good basis for the next step to establish confidence in overcoming the disease and make cognitive decisions.

1.2.3 Effect evaluation

(1)The main intervention effects of secondary prevention of coronary heart disease in the two groups were observed through regular outpatient review, follow-up and evaluation records of remote interactive platform. (2)The quality of life and self-health management status of patients in the two groups were tracked and evaluated using the Seattle Angina Pectoris Survey and Coronary Heart Disease Self-Management Behavior Scale (CSMS)for coronary heart disease[3-4].

1.3 Statistical methods

All data were entered into Epidata3. 5 database and processed by SPSS16. 0 software. Quantitative data were expressed as mean±standard deviation (x±s). The comparison of quantitative data before and after implementation was conducted by paired t-test, and the comparison of counting data was conducted by chi-square test, with the test level of P=0. 05.

2 Results

2.1 Comparison of secondary prevention effects between two groups

A total of 210 patients participated in the study. The whole follow-up period was uninterrupted, and there were no patients who were out of prevention. After one year of follow-up observation, the relapse and readmission rate of coronary heart disease, major adverse cardiovascular events and complications in the experimental group were significantly lower than those in the control group, with a statistically significant difference (P<0. 05).

2.2 Comparison of quality of life between the two groups

The difference between the two groups in the factor scores and total scores of the Seattle Angina Questionnaire was statistically significant (P<0. 05), suggesting that the quality of life of the experimental group was better than that of the control group;See Table 1.

Table 1 Comparison of the total score of quality of life and scores of each dimension between the two groups after 1 year of follow-up (score, x±s)

item	Control group (n=105)	Experimental group (n=105)	*t*	*P*
Degree of activity restriction	70. 31±17. 56	84. 08±17. 30	15. 732	<0. 05
Stability of angina pectoris	71.60±20. 24	85. 07±15. 27	14. 104	<0. 05
Angina attack	8 2.45±21.50	90. 32±20. 08	10. 251	<0. 05
Treatment satisfaction	78. 28±20. 41	89. 47±18. 10	13. 047	<0. 05
Subjective feeling of disease	65. 29±18. 77	72.10±15. 90	11. 003	<0. 05
total points	74. 27±21.56	84. 13±14. 50	11.729	<0. 05

2.3 Comparison of self-management behaviors of coronary heart disease between the two groups

The difference between the two groups in each factor score of coronary heart disease self-management behavior scale (CSMS)was statistically significant (P<0. 05), suggesting that the self-management behavior of the experimental group was better than that of the control group;See Table 2.

Table 2 Comparison of each factor score of coronary heart disease self-management behavior between the two groups (score, x±s)

dimension	Control group (n=105)	Experimental group (n=105)	*t*	*P*
Bad hobbies	10. 31±3. 70	14. 31±2.32	8. 043	<0. 05
General lifestyle	11.60±3. 18	15. 07±2.15	7. 505	<0. 05
symptom	10. 27±1.36	13. 27±2.59	5. 824	<0. 05
Disease cognition	11.15±2. 06	15. 47±3. 64	7. 971	<0. 05
Treatment	7. 29±1.20	8. 10±1.32	4. 002	<0. 05

compliance				
give first aid treatment	9. 37± 2.40	11.19±2.37	5. 270	<0. 05
Emotional management	1 2.40±2.35	15. 70± 2.44	6. 532	<0. 05

3 Discussion

At present, the prevalence and mortality of coronary heart disease in China are increasing significantly, which has become a major public health problem seriously affecting public health. Coronary heart disease is a lifelong disease, which is highly related to lifestyle. Even if the short-term effect of percutaneous coronary intervention is good, its long-term prognosis still depends on the realization of the secondary prevention goal of coronary heart disease. The secondary prevention of coronary heart disease is mainly to intervene multiple risk factors, reduce complications and adverse cardiovascular events, and improve the quality of life[5]by implementing comprehensive treatment for patients with coronary heart disease. Long-term clinical practice has proved that extended management under the remote monitoring platform system is one of the important ways to improve the effect of out-of-hospital rehabilitation of patients with chronic diseases. Especially for people with cardiovascular diseases such as coronary heart disease, extended management has changed the pattern of traditional medical services and become a key link to effectively achieve the relevant secondary prevention goals. However, previous research shows that at present, the current remote extension management procedures of most medical institutions are still lack of pertinence and cannot meet the needs of patients[6, 7]. It is mainly reflected in the fact that the matching effectiveness of management means in the specific monitoring process is not strong, and the degree of refinement is not high, which can not really drive the intrinsic enthusiasm of patients'self-health management at home[8]. The above problems greatly affect the actual effect of the extended management of secondary prevention of coronary heart disease.

In recent years, with the in-depth study of basic management theory in the medical field, the nursing theory in the relevant chronic disease management model has made great progress. "Roy's adaptive theory"was gradually put forward by foreign nursing expert Carlista Roy according to the role played by nurses in disease prevention, medical management, rehabilitation promotion and health education. In this theory, Roy defined people as a whole of biological, psychological and social attributes, and believed that the life course of an individual is a dynamic process of constantly adapting to internal and external stimuli and continuously improving health level[2, 9]. From the perspective of international research trends, some scholars believe that Roy's adaptive theory is based on the overall needs of the patient's body and mind, emphasizing the appropriate stimulation and adjustment of the individual in health promotion and health education, so that it can reach the best adaptive state of the environment, thus enhancing the patient's adaptability to the disease[10].

On the basis of the above research, this study focuses on the two themes of integration and adaptation, and proposes the construction of remote extended management of coronary heart disease in the perspective of Roy's adaptive theory, with a view to providing more high-quality remote extended management services for patients

with coronary heart disease at home. Roy's adaptive model, as a nursing intervention model, is first used as a management system to help patients adapt to their roles in receiving health education and guidance. The Roy adaptive model, which is the main link in the extended nursing process implemented in this study, is the specific implementation of the four adaptation models of this theory. By sharing information related to secondary prevention knowledge and combining with the evolution game of the main stimulus and related stimulus of information in health management, patients can truly participate in clinical diagnosis and treatment, make the best decision reasonably, and improve treatment compliance.

From the results of this experiment, this study is of great significance in improving the connotation of the means of extended management services for coronary heart disease. The results of this paper fully prove that remote extended management based on Roy's adaptive theory is an effective method for innovating long-term management of coronary heart disease, and has important application value in standardizing the effectiveness of secondary prevention strategies outside the hospital for coronary heart disease. Due to the relatively short development of the experimental study, the proposed path and steps of the extension management involved in this study still have defects and deficiencies. The solution of the above problems requires more theoretical research and management practice with a larger sample size in the future.

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基于罗伊自适应理论的远程延伸管理在冠心病患者二级预防中的作用研究

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【摘要】目的：在罗伊自适应理论视域下进行冠心病远程延伸管理的构建并对应用效果进行评估。方法：以入选的 210 例符合标准的冠心病患者按随机双盲分组（实验组和对照组），两组在院期间均经标准化治疗及护理，此基础上对照组（n=105 例）出院时接受责任护士常规出院指导及常规院外健康，实验组（n=105 例）则以罗伊自适应理论理论为支撑，团队合作下构建合理的多模态冠心病长期管理模式。持续随访观察 1 年，对两组出院 1 年后再入院率、主要心血管不良事件及并发症发生率进行记录观察，采用冠心病专用的西雅图心绞痛调查量表、冠心病自我管理行为量表对两组患者生活质量、自我健康管理状况进行跟踪评价。结果：实验组院外（1 年后）冠心病复发再入院率、主要心血管不良事件及并发症发生率均显著低于对照组，差异有统计学意义（P<0. 05）；同时，两组西雅图心绞痛调查量表、冠心病自我管理行为量表各因子分及总分的差异均有统计学意义（P<0. 05），实验组生活质量和自我管理行为均优于对照组。结论：基于罗伊自适应理论的远程延伸管理是创新冠心病长期管理的有效方法，对规范冠心病院外二级预防策略的有效性具有重要应用价值。

【关键词】罗伊自适应理论；多模态延伸管理；冠心病；二级预防

循证医学证据证实，优质的冠心病二级预防能够延缓和（或）逆转冠状动脉粥样硬化的进程，防止 PCI 术后心血管不良事件的发生[1]。对于冠心病患者来说，通过一系列延续性护理计划的实施保证院外二级预防效果的提升极为关键。然而, 目前已有的冠心病长期延伸管理方案大多停留在医疗资源远程监护开发方面, 远程医疗中的多主体优化任务并未形成成熟的配套方法。"罗伊自适应理论"是由美国护理专家罗伊提出的, 该理念立足于患者的身、心整体需要，强调对个体应对适应能力及反刍性沉思水平进行适当调整[2]。该理论在医疗体系整体健康管理和促进慢性病患者适应能力中是一个新型理论，具有前瞻群体预防保健的本质。本研究将该理论应用于冠心病远程延伸管理中, 本文将就管理特点及应用效果进行研究，旨在对提高冠心病长期管理升级有所帮助，具体报道如下:

1 资料与方法

1.1 病例资料

采用整群抽样法，选取 2019 年 10 月至 2021 年 2 月在内蒙古医科大学附属医院心内科、老年病科就诊的 210 例冠心病患者作为研究对象，其中男 126 例，女 84 例，年龄 45～80 岁，平均（59. 3±10. 5）岁，体质指数（22.8±3. 5）kg/m^2。

1.2 研究方法

1.2.1 分组

以上 210 例入选对象，按照随机双盲原则分为两组，即实验组（n=105 例）和对照组（n=105 例），两组在院期间均经标准化治疗及护理，此基础上对照组出院时接受责任护士常规出院指导及常规院外健康，实验组则以罗伊自适应理论理论为支撑，团队合作下构建合理的远程冠心病长期管理模式。两组人口学资料、冠心病类型及病程等一般资料进行比较，差异无统计学意义（P>0. 05），具有可比性。

1.2.2 罗伊自适应理论视域下冠心病远程延伸管理策略

1.2.2.1 体系构建和组织准备

以“为冠心病患者提供长期护理、康复支持、健康教育”为目标，依照规范的冠心病二级预防任务特点，以项目时间为框架，构建罗伊自适应理论框架下的冠心病远程延伸管理体系并做好组织准备。

1.2.2. 2 罗伊自适应理论支撑的远程延伸管理任务流程

①患者出院时，责任护士发放出院手册并进行详细的用药、自查、复查等出院指导，讲解社区、居家冠心病管理方案；在慢病管理网络平台完善患者档案信息，为患者注册网络平台个人账号，解释平台功能模块功能，使患者或家属熟悉掌握健康教育课堂和远程医疗安排。②要求患者或家属定期、不定期登录程序界面，责任护士定时登录网络平台核实患者情况，检查核实患者各项自主查体数值（如血压、心率、血糖、血脂、每日尿量、BMI 等）。随机和定期开展在线冠心病认知教育课程和病友俱乐部交流，回答患者疑问，以利于患者自我疾病管理经验的总结和病友分享经验；另外随机将患者的随访记录反馈给家庭照顾者，督促其家庭照顾者身份协助患者做好居家自我管理。

1.2.2.3 罗伊自适应理论的循证实践介入

远程延伸管理中，根据罗伊自适应理论针对个体适应调整的 4 个方式，即生理/物理方式、自我概念/群体身份方式、角色功能方式、相互依存方式来合理建立护患沟通和信任，从而使患者更好地参与到管理行动中。具体来讲，早期主要结合出院时群体疾病症状和心理状态，找出患者最早变化、最敏感的自我认知觉醒力，通过与患者交流，以群体身份方式帮助患者掌握冠心病二级预防干预机制和居家治疗方案的基本知识，提高康复治疗的自我概念意识，为下一步树立战胜疾病的信心、制定认知决策提供良好基础。

1.2.3 效果评价

（1）通过定期门诊复查、随访和远程互动平台的评估记录，观察两组冠心病二级预防主要干预效果。（2）采用冠心病专用的西雅图心绞痛调查量表、冠心病自我管理行为量表（CSMS）对两组患者生活质量、自我健康管理状况进行跟踪评价[3-4]。

1.3 统计学方法

全部资料录入 Epidata3. 5 数据库经 SPSS16. 0 软件进行处理，定量资料以均数±标准差（$\bar{x}$ ±s)表示，实施前后定量资料的比较用配对 t 检验，计数资料的比较行卡方检验，检验水平 P=0. 05。

2 结果

2.1 两组二级预防效果比较

本研究共有 210 例患者参与研究，随访全程均未间断实验，无脱防者，随访观察 1 年后，实验组患者冠心病复发再入院率、主要心血管不良事件及并发症发生率均显著低于对照组，差异有统计学意义（P<0. 05）。

2.2 两组生活质量比较

两组西雅图心绞痛调查量表各因子分及总分的差异有统计学意义（P<0. 05），提示实验组生活质量优于对照组；见表 1。

表 1 随访 1 年后两组生活质量总分及各维度得分比较[($\bar{x}$ ±s)分]

项目	对照组（n=105）	实验组（n=105）	*t*	*P*
活动受限程度	70. 31±17. 56	84. 08±17. 30	15. 732	<0. 05
心绞痛稳定情况	71.60±20. 24	85. 07±15. 27	14. 104	<0. 05
心绞痛发作情况	8 2.45±21.50	90. 32±20. 08	10. 251	<0. 05
治疗满意程度	78. 28±20. 41	89. 47±18. 10	13. 047	<0. 05
疾病主观感受	65. 29±18. 77	72.10±15. 90	11. 003	<0. 05
总分	74. 27±21.56	84. 13±14. 50	11.729	<0. 05

2.3 两组冠心病自我管理行为比较

两组冠心病自我管理行为量表（CSMS）各因子分的差异有统计学意义（P<0. 05），提示实验组冠心病自我管理行为优于对照组；见表 2。

表 2 两组冠心病自我管理行为各因子分比较[($\bar{x}$ ±s)分]

维度	对照组（n=105）	实验组（n=105）	*t*	*P*
不良嗜好	10. 31±3. 70	14. 31±2.32	8. 043	<0. 05
一般生活方式	11.60±3. 18	15. 07±2.15	7. 505	<0. 05
症状	10. 27±1.36	13. 27±2.59	5. 824	<0. 05
疾病认知	11.15±2. 06	15. 47±3. 64	7. 971	<0. 05
治疗依从性	7. 29±1.20	8. 10±1.32	4. 002	<0. 05
急救	9. 37± 2.40	11.19±2.37	5. 270	<0. 05
情绪管理	1 2.40±2.35	15. 70± 2.44	6. 532	<0. 05

3 讨论

目前国内冠心病患病率和病死率增高态势明显，已成为严重影响公众健康的重大公共卫生问题。冠心病属于终身性疾病，与生活方式高度相关，即使经皮冠状动脉 PCI 治疗短期效果良好的患者，其长期预后效果仍有赖于冠心病二级预防目标的实现。冠心病的二级预防主要是通过对冠心病患者实施综合治疗手段来干预多重危险因素，减少并发症和心血管不良事件，提高生活质量[5]。临床长期实践证实，在远程监护平台体系下的延伸管理是提高慢病患者院外康复效果的重要方式之一，尤其对于冠心病等心血管疾病人群，延伸管理改变了传统医疗服务的格局，成为有效实现相关二级预防目标的关键环节。然而

既往研究显示，就目前国内来讲，多数医疗机构现行的远程延伸管理程序仍然缺乏针对性，并不能满足患者需求[6、7]。主要体现在具体监护流程中管理手段的匹配有效性不强，精细化程度不高，无法真正驱动患者居家自我健康管理的内在积极性[8]，以上问题大大影响了冠心病二级预防延伸管理的实际效果。近年来，随着医学领域基础管理理论的研究深入，相关慢性疾病管理模型中的护理理论取得了很大进步。“罗伊自适应理论”是国外护理专家卡利斯塔·罗伊根据护士在疾病预防、医疗管理、康复促进、健康教育中所扮演的角色逐步提出的，罗伊在该理论中将人定义为生物、心理、社会属性的整体，认为个体的生命历程是一个不断对内外在刺激进行适应并持续提高健康水平的动态过程[2、9]。从国际研究动态来看，有学者认为，罗伊自适应理论立足于患者的身、心整体需要，强调在健康促进、健康教育中对个体进行适当刺激调整，使其能够达到环境的最佳适应状态，从而增强患者应对疾病的适应性[10]。

基于上述研究基础，本研究紧紧围绕整体与适应两大主题，提出了在罗伊自适应理论视域下进行冠心病远程延伸管理的构建，以期为居家冠心病患者提供更优质的远程延伸管理服务。罗伊自适应模式作为一种护理干预模型，首先是作为一个管理系统来帮助患者在接受健康教育指导中对角色不适应的问题。本研究实施的延伸护理程序中主要衔接的罗伊自适应模式是对该理论 4 种适应模式的具体贯彻，通过将与二级预防知识有关的信息共享，结合健康管理中信息主要刺激和相关刺激的演化博弈，使患者真正参与到临床诊疗中，合理做出最佳决策，以提高治疗依从性。

从本次实验数据结果来看，本研究在提升冠心病延伸管理服务的手段内涵方面意义重大，本文结果充分证明基于罗伊自适应理论的远程延伸管理是创新冠心病长期管理的有效方法，对规范冠心病院外二级预防策略的有效性具有重要应用价值。由于实验研究的开展相对较短，本研究涉及的延伸管理拟建路径和步骤仍存在缺陷和不足，以上问题的解决，需今后更多理论研究及更大样本量的管理实践来加以实现。

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