Observational Study

Effect of nursing intervention based on Maslow's hierarchy of needs in patients with coronary heart disease interventional surgery

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Author contributions: Xu JX and Fan GH designed the research study; Xu JX and Wu LX performed the research; Jiang W analyzed the data and wrote the manuscript. All authors have read and approve the final manuscript.

Institutional review board statement: The study was reviewed and approved by The First Affiliated Hospital of Qiqihar Medical College Institutional Review Board (Approval No. 202103).

Informed consent statement: All study participants, or their legal guardian, provided informed written consent prior to study enrollment.

Conflict-of-interest statement: The authors declare having no conflicts of interest.

Data sharing statement: No additional data are available.

STROBE statement: The authors have read the STROBE Statement—checklist of items, and the manuscript was prepared and

Abstract

BACKGROUND
It is very important to provide effective nursing programs to regulate the physical and mental state of patients and to improve treatment compliance after interventional surgery for coronary heart disease (CHD).

AIM
To explore the effect of a nursing intervention based on Maslow’s hierarchy of needs theory on patients with CHD undergoing percutaneous coronary intervention.

METHODS
Ninety-four patients with CHD undergoing interventional surgery in our hospital from January 2020 to February 2021 were randomly divided into a research group (n = 47) and a control group (n = 47). The control group received routine nursing, and the research group received a nursing intervention based on Maslow’s hierarchy of needs theory. The scores of self-efficacy, negative emotion [depression (SDS), anxiety (SAS)], intervention compliance (standardized medication, moderate exercise, healthy diet, and regular review), and nursing satisfaction were calculated before and after intervention for the two groups.

RESULTS
Before intervention, there was no significant difference in the scores of disease general management self-efficacy, disease management self-efficacy, and total self-efficacy between the two groups (P = 0.795, 0.479, and 0.659, respectively). After intervention, these three scores in the research group were higher than those in the control group (P < 0.001). Before intervention, there was no significant difference in the scores of SAS and SDS between the two groups (P = 0.149 and 0.347, respectively). After intervention, the scores of SAS and SDS in the research group were lower than those in the control group (P < 0.001). The standardized drug use rate (97.87%), moderate exercise rate (97.87%), healthy diet rate (95.74%),
A nursing intervention study based on Maslow’s hierarchy of needs

INTRODUCTION

Coronary heart disease (CHD) is clinically a multiple cardiovascular disease. It is mainly a type of heart disease that is caused by myocardial ischemia and hypoxia due to coronary vascular stenosis or obstruction. If the patient does not receive timely and effective intervention, heart failure can develop as the disease progresses. It is also accompanied by different degrees of edema, fatigue, and dyspnea, among others. Furthermore, acute pulmonary edema, cardiogenic shock, and other manifestations may occur in cases of acute exacerbations, which is a great threat to the life and health of patients. As an important measure for the clinical treatment of CHD, interventional surgery can restore myocardial blood supply and reduce the risk of death. However, it affects treatment compliance and is not conducive to the outcomes of diseases due to postoperative drug treatment. The resulting treatment costs and patients’ concerns about the therapeutic effect and recurrence of the disease lead to a huge physical and mental burden on patients[1-3]. Consequently, it is very important to provide effective nursing programs to regulate the physical and mental state of patients and improve treatment compliance after interventional surgery for CHD. Hence, promotion of good disease outcomes is vital[4,5].

Routine nursing care for patients is mostly done passively. Paying attention only to the completion of one’s work and not paying enough attention to the pathological needs and emotional needs of patients can result in limitations of the clinical application of nursing care[6,7]. Maslow’s hierarchy of needs theory divides human needs into five levels, including physiology, safety, attribution and love, respect, and self-realization. It advocates nursing care according to the stage of the patient to meet the individual pathological psychological needs to the maximum extent.

Hence, this study selected 94 patients undergoing interventional surgery for CHD in our hospital to explore the application value of nursing intervention based on Maslow’s hierarchy of needs theory.
MATERIALS AND METHODS

General data
This study was approved by the Ethics Committee of our hospital. A total of 94 patients with CHD undergoing interventional surgery in our hospital from January 2020 to February 2021 were randomly divided into a research group (n = 47) and a control group (n = 47).

Selection criteria
Inclusion criteria: The inclusion criteria were as follows: (1) Patients who met the diagnostic criteria of CHD[8]; (2) Patients aged < 80 years; (3) All patients treated with interventional therapy; and (4) Patients and their families who were aware of this study and signed the consent form.

Exclusion criteria: Patients who met the following criteria were excluded: Patients with (1) Benign and malignant tumors; (2) Mental diseases; (3) Subarachnoid hemorrhage; (4) Stroke; (5) Organic diseases involving the kidney and liver; (6) Speech and communication disorders and hearing impairment; or (7) A history of alcohol and drug dependence; and (8) Those receiving antianxiety/antidepressants.

Methods
Control group: Routine nursing was performed. This included health education and formulation of individualized health education programs with reference to patients' cognition of rehabilitation after coronary intervention, including the importance of rehabilitation exercise, medication knowledge and matters needing attention, and ways to deal correctly with cardiac emergencies, among others. Health education can be carried out in various forms, such as health lectures and patient exchanges. Rehabilitation training and passive exercise were conducted after leaving the danger period, and rehabilitation exercise plan, exercise intensity, and exercise form were determined according to the individual condition of patients and comprised mainly aerobic exercises, such as tai chi, walking, and simple gymnastics. The psychological state of patients was mastered through active communication and targeted intervention. Meal plans were made according to the patients’ personal preferences and the need for disease rehabilitation, mainly including light and digestible foods.

Research group: Nursing intervention was based on Maslow’s hierarchy of needs theory. Physiological needs include the following: (1) Keeping the respiratory tract unobstructed, cleaning up oral and respiratory secretions and foreign bodies in time, guiding patients on how to cough and breathe deeply, regularly assisting patients to change their posture, turning over and tapping on their backs to promote sputum excretion, providing sputum suction and oxygen therapy, controlling blood oxygen saturation at 90%, and providing ventilator intervention during signs of respiratory weakness; (2) Closely monitoring vital signs, such as blood oxygen saturation, blood pressure, heart rate, self-consciousness, and other vital signs to help patients position themselves correctly and comfortably; (3) Guiding patients to promote sleep by means of soaking their feet and providing music, prolonging sleep time, improving sleep quality, and ensuring adequate sleep; and (4) Advising patients to eat more foods that are rich in fiber and vitamins while controlling total caloric intake and minimizing salt intake to 6 g.

Safety requirements include the following: (1) Prevention of urinary and respiratory infections, regular disinfection of wards, ventilation, ultraviolet disinfection once a day, postural drainage and sputum drainage to avoid the occurrence of pendant pneumonia, daily replacement of humidifying bottles and oxygen tubes, strict disinfection of sputum suction/ventilator, strict compliance with aseptic operation when carrying out relevant nursing measures, and nursing care of urinary catheter and oral cavity twice a day; (2) Preventing pressure sores, assisting patients to turn over every 2 h, massaging pressure areas, ensuring that sheets are dry and tidy, keeping the skin dry and clean, paying attention to gentle movements when moving patients, prohibiting procrastination, and using bedsore mats for those with vague consciousness and serious illness; and (3) Installing guardrails and bedside lamps for the hospital bed to avoid adverse events, such as falls, and ensuring that the floor of toilets and the ward is dry and clean, placing anti-skid signs and floor mats, and installing handrails in the corridor.

Love and belonging needs include the following: Evaluating patients’ psychological state, giving targeted psychological counseling, encouraging patients to express their subjective feelings, assisting patients in dealing with problems encountered during
rehabilitation, teaching patients how to regulate their emotions, making patients aware of the importance of maintaining a positive mentality to alleviate their disease, and making them actively regulate negative emotions. When communicating with patients, one should pay attention to patience and enthusiasm, give patients full respect, gain their trust and goodwill, maintain a good nurse-patient relationship, and communicate with patients’ families and friends in a timely manner. In addition, it is necessary to explain the important impact of external support on patients’ recovery and psychological state, encourage them to spend more time with patients, ensure that love, care, and family warmth and support are provided, and eliminate loneliness.

Respecting needs include the following: Decreased self-care ability of patients undergoing interventional therapy for CHD and affected by the disease itself and the treatment. Patients are extremely prone to self-remorse or guilt; therefore, nurses should be patient enough to meet the reasonable needs of patients to the maximum extent or to provide reasons for not being able to meet such needs in order to avoid harming the self-esteem of patients. During the intervention, one should pay attention to strengthening the positive behavior of patients in the form of affirmation and praise to make them correct their bad behavior independently.

Self-fulfilling needs include the following: Waiting for the patient’s condition to become stable, guiding them to carry out functional rehabilitation training, and enhancing their ability of life in daily life. In addition, it is necessary to organize communication meetings in order to share rehabilitation experiences.

**Observation index**

The scores of self-efficacy of the two groups before and after intervention were calculated. According to the Chronic Disease Self-Efficacy Scale, the scores were based on six items, including disease common management self-efficacy and disease management self-efficacy, from “complete lack of confidence” to “absolute confidence” (1-10). The higher the score, the better.

The scores of negative emotions [depression (SDS), anxiety (SAS)] of the two groups before and after intervention were evaluated according to the SDS and SAS scale. This is classified according to the following: Mild depression: SDS score 53-62, moderate depression: 63–72, severe depression: ≥ 73; mild anxiety: SAS: 50–59, moderate anxiety: 60–69, and severe anxiety: ≥ 69 [10]. Statistics on the compliance of intervention between the two groups included standardized medication, moderate exercise, healthy diet, and regular reexamination. The nursing job satisfaction questionnaire was designed by the patients, and nursing job satisfaction of the two groups was assessed. The total score of intervention attitude and quality was graded using a 100 points scale, where 90–100 points was classified as very satisfactory, 70–89 points as satisfactory, and <70 points as dissatisfactory. Nursing job satisfaction was calculated as follows:

\[
\text{Nursing job satisfaction} = \frac{(\text{very satisfied} + \text{satisfied})}{\text{total number of cases}} \times 100\%.
\]

**Statistical analyses**

The data obtained were analyzed using SPSS version 22.0 (Armonk, NY, United States). Measurement data were expressed with mean ± SD, and analyzed using \( t \) test. Counting data were expressed with \( n(\%) \), and were analyzed using \( \chi^2 \) test. \( P < 0.05 \) indicated statistically significant differences.

**RESULTS**

**Demographic data**

The clinical data of the two groups were balanced and comparable (\( P > 0.05 \)), as shown in Table 1.

**Chronic Disease Self-Efficacy Scale demographic data**

Before intervention, there was no significant difference in the scores of disease general management self-efficacy, disease management self-efficacy, and total self-efficacy between the research group and the control group (\( P = 0.795, 0.479, 0.659 \), respectively). After intervention, the three scores in the research group were higher than those in the control group (\( P < 0.001 \) (Table 2).

**SAS and SDS scores**

Before intervention, there was no significant difference in the SAS and SDS scores
Table 1 Comparison of two groups of general data, \( n \% \)

| Items                        | Research group, \( n = 47 \) | Control group, \( n = 47 \) | \( t \) | \( P \) value |
|------------------------------|-------------------------------|-----------------------------|------|--------------|
| Age (49.76 ± 9.63)          | 48.79 (64.34 ± 10.09)         | 0.909                       | 0.366|
| Gender                       |                               |                             | 0.386| 0.535       |
| Male (51.09)                 | 27 (57.45)                    |                             |      |              |
| Female (48.94)               | 20 (42.55)                    |                             |      |              |
| Course of disease in yr      | 1.0-6.5 (3.75 ± 2.25)         | 0.5-7.5 (4.00 ± 2.55)       | 0.504| 0.616       |
| Education level              |                               |                             |      |              |
| Primary school and junior high school | 21 (44.68) | 25 (53.19) | 0.805| 0.423       |
| High school                  | 19 (40.43)                    | 16 (34.04)                  | 0.492| 0.624       |
| College or above             | 7 (14.89)                     | 6 (12.77)                   | 0.120| 0.905       |
| Concomitant disease          |                               |                             |      |              |
| Diabetes                     | 6 (12.77)                     | 4 (8.51)                    | 0.231| 0.818       |
| High blood pressure          | 11 (23.40)                    | 14 (29.79)                  | 0.421| 0.675       |
| Others                       | 5 (10.64)                     | 7 (14.89)                   | 0.236| 0.814       |
| Occupation type              |                               |                             |      |              |
| Farmers                      | 18 (38.30)                    | 21 (44.68)                  | 0.528| 0.599       |
| Workers                      | 4 (8.51)                      | 2 (4.26)                    | 0.220| 0.826       |
| Cadres                       | 3 (6.38)                      | 6 (12.77)                   | 0.342| 0.733       |
| Others                       | 22 (46.81)                    | 18 (38.30)                  | 0.716| 0.476       |

Table 2 Comparison of chronic disease self-efficacy scale scores between the two groups (mean ± SD)

| Group          | Number | Self-efficacy of disease commonality management | Disease management self-efficacy | Total score |
|----------------|--------|-----------------------------------------------|---------------------------------|-------------|
| Before intervention |       |                                               |                                 |             |
| Research        | 47     | 8.89 ± 2.83                                   | 20.23 ± 4.12                    | 29.12 ± 4.69|
| Control         | 47     | 9.05 ± 3.11                                   | 19.65 ± 3.79                    | 28.70 ± 4.51|
| \( t \)         | 0.261  | 0.710                                         | 0.443                           |             |
| \( P \) value   | 0.795  | 0.479                                         | 0.659                           |             |
| After intervention |      |                                               |                                 |             |
| Research        | 47     | 16.05 ± 3.25                                  | 29.09 ± 3.88                    | 45.14 ± 5.35|
| Control         | 47     | 13.13 ± 2.94                                  | 24.30 ± 4.23                    | 37.43 ± 4.81|
| \( t \)         | 4.583  | 5.743                                         | 7.385                           |             |
| \( P \) value   | < 0.001| < 0.001                                       | < 0.001                         |             |

between the two groups (\( P = 0.149 \) and \( P = 0.347 \), respectively). After intervention, both scores in the research group were lower than those in the control group (\( P < 0.001 \)) (Table 3).

**Intervention compliance**

The standardized drug use rate (97.87%), moderate exercise rate (97.87%), healthy diet rate (95.74%), and regular reexamination rate (97.87%) in the research group were higher than those in the control group (85.11%, 82.98%, 80.85%, and 87.23%, respectively) (\( P = 0.027, 0.014, 0.025, \) and \( 0.049 \), respectively) (Table 4).

**Nursing job satisfaction**

Nursing job satisfaction in the research group (93.62%) was higher than that in the control group (78.72%) (\( P = 0.036 \)) (Table 5).
**Table 3 Comparison of anxiety and depression scores between two groups (mean ± SD)**

| Group            | Number | SAS         | SDS         |
|------------------|--------|-------------|-------------|
| **Before intervention** |        |             |             |
| Research         | 47     | 58.31 ± 5.08 | 60.56 ± 6.62 |
| Control          | 47     | 59.92 ± 5.64 | 61.89 ± 7.01 |
| t                | 1.454 | 0.946       |             |
| P value          | 0.149 | 0.347       |             |
| **After intervention** |        |             |             |
| Research         | 47     | 43.64 ± 4.89 | 45.60 ± 5.44 |
| Control          | 47     | 48.59 ± 5.33 | 51.31 ± 6.07 |
| t                | 4.706 | 4.803       |             |
| P value          | < 0.001 | < 0.001 |             |

SAS: Anxiety; SDS: Depression.

**Table 4 Comparison of intervention compliance between the two groups, n (%)**

| Group | Number | Standardize the use of drugs  | Moderate exercise | Healthy diet | Regular review |
|-------|--------|-------------------------------|-------------------|--------------|----------------|
| Research | 47     | 46 (97.87)                     | 46 (97.87)        | 45 (95.74)   | 46 (97.87)     |
| Control  | 47     | 40 (85.11)                     | 39 (82.98)        | 38 (80.85)   | 41 (87.23)     |
| $\chi^2$ |        | 4.919                          | 6.021             | 5.045        | 3.859          |
| P value  |        | 0.027                          | 0.014             | 0.025        | 0.049          |

**Table 5 Comparison of nursing job satisfaction between the two groups, n (%)**

| Group | Number | Very satisfied  | Satisfied | Dissatisfied | Total satisfaction |
|-------|--------|-----------------|-----------|--------------|--------------------|
| Research | 47     | 29 (61.70)       | 15 (31.91) | 3 (6.38)     | 44 (93.62)         |
| Control  | 47     | 19 (40.43)       | 18 (38.30) | 10 (21.28)   | 37 (78.72)         |
| $\chi^2$ |        | 4.374            |           |              | 0.036              |
| P value  |        |                  |           |              |                   |

**DISCUSSION**

It is difficult for patients to recover immediately after interventional surgery. Additionally, patients are affected by the disease itself as well as by the interventional surgery and postoperative rehabilitation treatment. There are different degrees of depression and anxiety, which have adverse effects on intervention compliance and disease rehabilitation [11-13]. Consequently, it is very important for patients with CHD to have the support of effective nursing interventions after interventional operations.

Routine nursing lacks systematisms and timeliness, and problems, such as unhealthy diet and irregular medication use, still occur during the intervention period. Hence, it is difficult to meet the rehabilitation needs of patients with CHD after intervention [14]. Maslow’s hierarchy of needs theory holds that there are five different levels of needs, and there are significant differences in the urgency of various needs across different periods. Patients usually show the strongest urgency for physiology, safety, attribution, and love during hospitalization, followed by the need for respect and self-realization. Additionally, the needs of the next level will appear only after the needs of the former level are effectively met. With changes in medical concepts, meeting the multiple levels of needs of patients to the greatest extent has become the goal of clinical nursing work [15-17]. Therefore, nursing should start at the most basic level, by prioritizing meeting the physiological needs of patients and systematically...
meeting the needs of other levels of patients to provide patients with targeted and effective nursing services in clinical practice. Lester et al. [18] showed that a nursing intervention based on Maslow’s hierarchy of needs, during the rehabilitation of patients with acute myocardial infarction after PCI, effectively improved their medication compliance and regulated their psychological state. The results of a study by Zalenski et al. [19] showed that such a nursing intervention alleviated the negative emotion of inpatients in cardiology departments, restored their ability to engage in daily life, improved their quality of life, shortened hospitalization time, and urged patients to recover and leave the hospital as soon as possible. The results of this study showed that the scores on all dimensions of self-efficacy in the research group with the nursing plan based on Maslow’s hierarchy of needs theory were higher than those in the control group. However, the SDS and SAS scores in the research group were lower than those in the control group. Findings also showed that the standardized medication rate (97.87%), moderate exercise rate (97.87%), healthy diet rate (95.74%), and regular review rate (97.87%) in the research group were higher than those in the control group ($P < 0.05$). In addition, nursing intervention could effectively alleviate the negative mood of patients undergoing coronary intervention surgery, improve self-efficacy, and improve patients’ compliance to interventions. This may be because conventional nursing pays attention to providing only basic nursing services for patients. The nursing process tends to be mechanized, and its content and form are single; hence, it is difficult to meet effectively the physical and mental needs of patients. Nursing plans based on Maslow’s hierarchy of needs theory provide personalized nursing services based on the specific nursing needs of patients, which involve many aspects, such as psychological, physiological, spiritual, social, and cultural needs, along with logical nursing measures. With clear intervention objectives, various nursing measures are associated with good certainty, predictability, and pertinence, which can effectively meet the pathophysiological needs of the patients. Furthermore, attention should be paid to the gradual transition from physiological needs to high-level needs in order to improve the psychological state and enhance the compliance of patients to interventions while urging them to cooperate actively with the treatment and nursing work in the nursing plan based on this theory [20]. In addition, the physiological needs of patients in the research group are effectively met through dietary guidance; ensuring cleanliness and hygiene in the ward and regularly assisting in turning over patients, along with strengthening safety protections that effectively meet the safety needs of patients; psychological interventions and strengthening external support can meet patients’ love and belonging needs and respect needs; patient exchanges can meet the needs of self-realization, enhance self-value, and regulate physical and mental states from multiple levels during the nursing period.

In addition, satisfaction with the nursing job in the research group was higher than that in the control group ($P < 0.05$). This suggests that the nursing scheme based on Maslow’s hierarchy of needs theory can also deepen the recognition of nursing work among patients undergoing interventional surgery for CHD. The main reason is that it can alleviate negative emotions and improve the self-efficacy of patients, providing higher satisfaction.

**CONCLUSION**

Generally, the intervention for patients with CHD based on Maslow’s hierarchy of needs theory can effectively alleviate patients’ negative emotions, enhance self-efficacy, and enhance intervention compliance. In addition, patients report high satisfaction with the nursing work. However, most of the indicators selected in this study were subjectively evaluated by patients and objective indicators were lacking. Therefore, the effectiveness of the research still needs to be further explored and confirmed by clinical selection of other objective indicators.

**ARTICLE HIGHLIGHTS**

**Research background**

If patients with coronary heart disease (CHD) do not receive timely and effective intervention, heart failure can develop as the disease progresses.
Xu JX et al. A nursing intervention study based on Maslow’s hierarchy of needs

Research motivation
Routine nursing care for patients is mostly done passively, with not enough attention paid to the pathological needs and emotional needs of patients.

Research objectives
We want to explore the application value of nursing intervention based on Maslow’s hierarchy of needs theory.

Research methods
We selected 94 patients with CHD undergoing interventional surgery in our hospital and divided into research group and control group.

Research results
Nursing job satisfaction in the research group (93.62%) was higher than that in the control group (78.72%).

Research conclusions
The intervention for patients with CHD based on Maslow’s hierarchy of needs theory has high satisfaction with the nursing work.

Research perspectives
The effectiveness of the research still needs to be further explored and confirmed by clinical selection of other objective indicators.

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