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Original Article

Predictive nursing helps improve treatment efficacy, treatment compliance, and quality of life in unstable angina pectoris patients

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Abstract: Objective: This paper aims to explore the effects of predictive nursing on the treatment efficacy in unstable angina pectoris (UAP) patients and on their treatment compliance and quality of life (QOL). Methods: Admitted to our hospital from November 2017 to August 2019, 110 UAP patients were recruited as the study cohort and randomized into a control group (CG) and an observation group (OG). Among them, 53 patients in the CG underwent routine nursing, and the remaining 57 patients in the OG underwent additional predictive nursing in addition to the routine nursing. The patients in both groups were observed with respect to their general data, the therapeutic effects after the nursing, their clinical indicators (length of hospital stays, stable states of angina pectoris, attacks of angina pectoris), their treatment compliance after the nursing, their negative emotions before and after the nursing, their adverse reactions during the nursing, and the changes in their blood pressure (diastolic blood pressure, systolic blood pressure) and QOL indices after the nursing. Results: There were no differences in the general data between the two groups ($P>0.05$), but the clinical indicators were better in the OG ($P<0.05$). After the nursing, the treatment compliance and improvement of the negative emotions were better in the OG ($P<0.05$), and the efficacy was also better in this group ($P<0.05$). The incidence of adverse reactions was lower in the OG ($P<0.05$), and the changes in the blood pressure indices were better in this group ($P<0.05$). After the nursing, the QOL in the OG was better ($P<0.05$). Conclusion: Predictive nursing is conducive to improving the efficacy, the treatment compliance, and the QOL of UAP patients.

Keywords: Predictive nursing, unstable angina pectoris, treatment compliance

Introduction

Unstable angina pectoris (UAP), a kind of cardiodynia caused by myocardial ischemia, progresses rapidly after its onset. If active and effective treatment and nursing measures are not taken, the disease can progress to myocardial infarction, thereby posing a serious threat to the life and health of patients [1, 2]. With the development of medical technology, the clinical treatment for UAP has become more effective, and its symptoms, such as angina pectoris, can be significantly alleviated [3]. However, due to diseases and other factors, many patients have unstable emotions and poor treatment compliance, which greatly and negatively affect their treatment and prognoses [4, 5]. Therefore, the assistance of scientific and effective nursing is necessary during UAP treatment.

As a model that is derived from evidence-based nursing, predictive nursing refers to scientific and effective nursing for symptoms with the risk of occurrence before the diseases occur; it can reduce the occurrence probability of adverse symptoms and improve the therapeutic effects and prognosis [6, 7]. According to previous studies, this nursing model alleviates the progression of Alzheimer's disease and prevents a series of adverse complications in elderly patients [8]. Nursing measures after treatment are essential for UAP patients, because scientific and reasonable nursing can reduce the incidence of angina pectoris and other adverse complications [9]. We suspect that this may be related to the improvement of treatment compliance. Although the effects of predictive nursing on UAP have been analyzed in some studies [10], there is no in-depth analy-

sis about its effects on the treatment compliance of patients.

In this study, the effects of predictive nursing on the efficacy in UAP patients and on their treatment compliance and quality of life (QOL) were analyzed, in order to provide more reference data for choosing nursing schemes.

Materials and methods

Clinical data

Admitted to South Hospital of Chenzhou First People's Hospital from November 2017 to August 2019, 110 UAP patients were recruited as the study cohort and divided into the control group (CG) and the observation group (OG). Among them, 53 patients in the CG underwent routine nursing, and the remaining 57 patients in the OG underwent predictive nursing in addition to the routine nursing. The inclusion criteria were as follows: patients who met the diagnostic criteria of UAP [11], patients between 60 and 70 years old, and patients with a BMI between 21 and 24. All the patients agreed with this study and signed the informed consent forms. The exclusion criteria were as follows: Patients also suffering from malignancies, patients with other serious organic diseases, patients with severe coagulation disorders, patients who suffered from communication barriers, and patients who did not cooperate with this research. This study was approved by the ethics committee of our hospital and was conducted, according to the *Declaration of Helsinki*.

Nursing methods

The patients in the CG underwent routine nursing intervention, which mainly included monitoring their vital signs after admission, communicating their treatment situations to them, and providing dietary guidance.

The patients in the OG underwent predictive nursing in addition to the routine nursing. The specific contents were as follows: (1) first, the predictive nursing of emotions was conducted. After admission, the nursing staff actively communicated with the patients and learned the emotional sources of those with negative emotions. The staff gave them full relief, helped them relieve the negative emotions and improve their moods, with gentle and patient actions and language. Also, the staff met their needs as much as possible, guided them in adjusting and controlling their emotions, and prevented them from experiencing any physical discomfort due to excited emotions. Their families were instructed not to provoke them. (2) The patients underwent health education. In view of their low awareness of UAP, the nursing staff actively and patiently explained the disease to them using brochures, explained the danger of angina pectoris, and instructed them to always carry a Quick-Acting Heart Reliever. Additionally, the staff trained them and their families in myocardial infarction first aid, emphasized the importance of following the doctor's advice for the treatment, and advised them to pay attention to the UAP-related precautions. (3) The analysis and nursing of the predictive conditions was then performed. The nursing staff closely monitored their conditions, and promptly provided corresponding solutions when they suffered from any discomfort. The staff especially monitored their blood pressure, in order to avoid any excessive fluctuations in their blood pressure that could induce angina pectoris. Moreover, corresponding defensive measures were taken against the related factors that may cause angina pectoris. (4) Finally, predictive interventions in their personal habits were conducted. The nursing staff helped them develop healthy living habits, and made exercise plans according to their actual physical conditions, so as to enhance their bodily constitution and immunity and improve their conditions.

Outcome measures

(1) The clinical efficacy in both groups was assessed, and the treatments were divided into markedly effective (the clinical symptoms disappeared and the electrocardiogram was normal), effective (the clinical symptoms and the electrocardiogram were improved), and ineffective (the clinical symptoms and the electrocardiogram were not improved). Overall response rate (ORR) = (markedly effective + effective) cases/total number of cases × 100%. (2) The patients' lengths of hospital stays (LOS) were observed. The stable states and attacks of angina pectoris were recorded and compared between the two groups by using the Seattle Angina Questionnaire (SAQ) [12]. (3)

Table 1. General patient information

Factors	Observation group (n=57)	Control group (n=53)	χ^2	P
Gender			0.031	0.860
Male	30 (52.63)	27 (50.94)		
Female	27 (47.37)	26 (49.06)		
Age (years)			0.006	0.938
≤65	23 (40.35)	21 (39.62)		
>65	34 (59.65)	32 (60.38)		
BMI (kg/m^2)			0.027	0.870
≤23	26 (45.61)	25 (47.17)		
>23	31 (54.39)	28 (52.83)		
History of smoking			0.009	0.923
Yes	36 (63.16)	33 (62.26)		
No	21 (36.84)	20 (37.74)		
Types			0.060	0.971
Spontaneous angina pectoris	27 (47.37)	24 (45.28)		
Mixed angina pectoris	18 (31.58)	17 (32.08)		
Others	12 (21.05)	12 (22.64)		
History of alcoholism			0.009	0.926
Yes	22 (60.98)	20 (64.86)		
No	35 (39.02)	33 (35.14)		

The Self-rating Anxiety Scale (SAS) and the Self-rating Depression Scale (SDS) [13] were used to evaluate the patients' negative emotions before and after the nursing. (4) The compliance scale (designed by our hospital) was used to assess and compare the treatment compliance between the two groups. The total score of the scale was 100 points. The treatment compliance was divided into 3 grades: non-compliance (<60 points), partial compliance (60-90 points), and complete compliance (>90 points). Overall compliance rate = (partial compliance + complete compliance) cases/total number of cases × 100%. (5) Before and after the nursing, the systolic blood pressure (SBP) and diastolic blood pressure (DBP) changes in both groups were observed. (6) The incidences of complications during hospitalization in the two groups were recorded and compared. The complications included heart failure, myocardial infarction, and death. (7) The MOS 36-Item Short-Form Health Survey (SF-36) [14] was used to investigate the patients' QOL, which consisted of physiological, social, emotional, and physical functions. Higher SF-36 scores indicate a better QOL. (8) The patients' nursing satisfaction (very satisfied, satisfied and dissatisfied) was evaluated using questionnaires.

Statistical methods

In this study, SPSS 20.0 (Beijing NDTimes Technology Co., Ltd.) was used for the statistical analysis of the data, and the experimental statistical charts were drawn using GraphPad Prism 8. The measurement data were expressed as the mean ± standard deviation and compared using t-tests. The comparisons before and after the nursing were conducted using paired t-tests. The count data were compared using chi-square tests. A *P* value lower than 0.05 was considered to be statistically significant.

Results

Comparison of the general data

There were no significant differences in terms of gender, age, or body mass index (BMI) between the OG and CG (P>0.05), which indicated comparability (**Table 1**).

Comparison of the clinical efficacy

After the nursing, the clinical efficacy was compared between the two groups. In the OG, 35 patients were markedly effective, 17 were effective, and 5 were ineffective, for an ORR of 91.23%. In the CG, 26 were markedly effective, 14 were effective, and 13 were ineffective, for an ORR of 75.47%. The clinical efficacy in the OG was remarkably better (P<0.05) (**Table 2**).

Comparison of the clinical indicators

The LOS, the stable states of angina pectoris, and the attacks of angina pectoris in both groups were recorded and evaluated. The LOS in the OG was remarkably shorter; after the nursing, the improvement in the angina pectoris was remarkably better (P<0.01) (**Table 3**).

Comparison of the SAS and SDS scores

Before and after the nursing, the SAS and SDS scores were used to evaluate the negative

Table 2. Comparison of the clinical efficacy

Groups	Observation group (n=57)	Control group (n=53)	X^2	P
Markedly effective	35 (61.40)	26 (49.06)	-	-
Effective	17 (29.82)	14 (26.42)	-	-
Ineffective	5 (8.77)	13 (24.53)	-	-
ORR	52 (91.23)	40 (75.47)	4.982	0.026

Table 3. Comparison of the clinical indicators

Indicators	Observation group (n=57)	Control group (n=53)	t	P
LOS (H)	5.21±0.43	8.46±1.03	21.87	<0.001
Stable states of angina pectoris	3.62±0.46	2.27±0.31	17.91	<0.001
Attacks of angina pectoris	7.91±1.13	6.27±1.01	8.003	<0.001

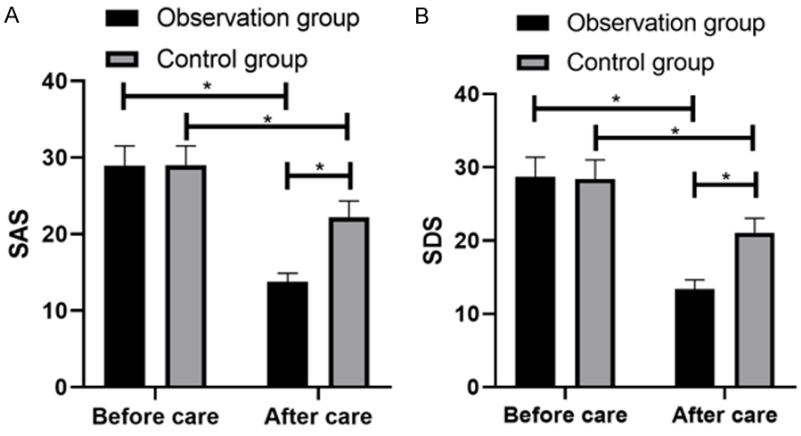

Figure 1. Comparison of the SAS and SDS scores. A: Comparison of the SAS scores; B: Comparison of the SDS scores. * indicates P<0.05.

Table 4. Comparison of the treatment compliance

Groups	Observation group (n=57)	Control group (n=53)	X^2	P
Complete compliance	31 (54.39)	20 (37.74)	-	-
Partial compliance	24 (42.11)	18 (33.96)	-	-
Non-compliance	2 (3.51)	15 (28.30)	-	-
Overall compliance rate	55 (96.49)	38 (71.70)	12.92	<0.001

emotions of the patients in both groups. Before the nursing, the two scores were not significantly different between the two groups (P>0.05). After the nursing, the scores in both groups were improved remarkably, but the improvement in the OG was more significant (P<0.05) (**Figure 1**).

Comparison of the treatment compliance

After the nursing, the treatment compliance of the patients in the two groups was recorded and compared. In the OG, there were 31 cases of complete compliance, 24 cases of partial compliance and 2 cases of non-compliance, for a treatment compliance rate of 96.49%. In the CG, there were 20 cases of complete compliance, 18 cases of partial compliance, and 15 cases of non-compliance, for a treatment compliance rate of 71.70%. The treatment compliance in the OG was significantly higher (P< 0.05) (**Table 4**).

Changes in the blood pressure indices before and after the nursing

Before and after the nursing, the SBP and DBP changes in the two groups were observed and compared. The improvement of the two indices in the OG was better (P<0.05) (**Figure 2**).

Comparison of the incidences of complications during the hospitalization

In the OG, the numbers of patients with heart failure, myocardial infarction, and death were 1, 2 and 1, respectively, for an incidence of complications of 6.90%. In the CG, the numbers were 3, 6, and 3, respectively, for an incidence of 20.69%. The incidence in the OG was remarkably lower (P<0.05) (**Table 5**).

QOL at one month after discharge

The physiological, social, emotional, and physical function scores in the OG were all significantly higher than the scores in the CG, so the QOL was higher in the observation group (P<0.05) (**Table 6**).

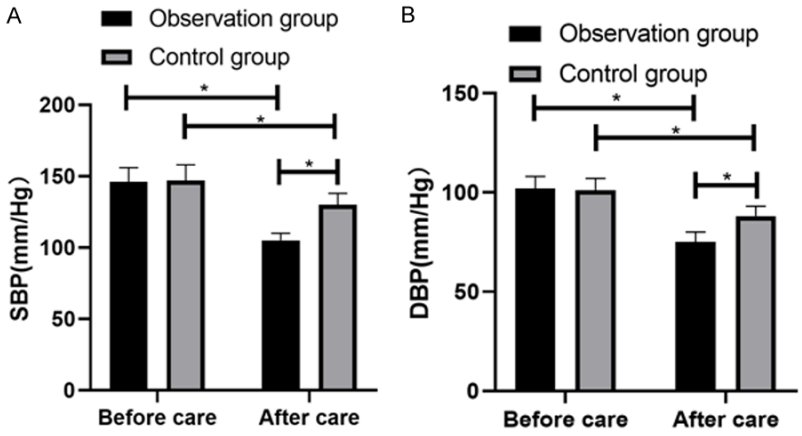

Figure 2. Changes in the blood pressure indices before and after the nursing. A: A comparison of the SBP; B: A comparison of the DBP. * indicates P<0.05.

Table 5. Comparison of the incidences of complications

Complications	Observation group (n=57)	Control group (n=53)	X^2	P
Heart failure	1 (1.75)	3 (5.66)	-	-
Myocardial infarction	2 (3.51)	6 (11.32)	-	-
Death	1 (1.75)	3 (5.66)	-	-
Total incidence	4 (7.02)	12 (22.64)	5.394	0.020

Table 6. Comparison of the QOL

Items	Observation group (n=57)	Control group (n=53)	t	P
Physiological function	15.31±1.26	10.11±1.12	22.81	<0.001
Social function	14.83±1.35	11.16±1.24	14.82	<0.001
Emotional function	15.85±2.06	11.26±1.34	13.74	<0.001
Physical function	14.47±1.31	10.28±1.22	17.32	<0.001

Table 7. Comparison of the nursing satisfaction [n (%)]

Groups	Observation group (n=57)	Control group (n=53)	X^2	P
Very satisfied	40 (70.18)	22 (41.51)	-	-
Satisfied	16 (28.07)	18 (33.96)	-	-
Dissatisfied	1 (1.75)	13 (24.53)	-	-
Nursing satisfaction	56 (98.25)	40 (75.47)	12.82	<0.001

Comparison of nursing satisfaction

In the OG, 40 cases were very satisfied, 16 were satisfied, and 1 was dissatisfied with the nursing, for a nursing satisfaction rate of 98.25%. In the CG, 22 cases were very satisfied, 18 were satisfied, and 13 were dissatisfied with the nursing, for a rate of 75.47%. The nursing satisfaction in the OG was remarkably higher (P<0.05) (**Table 7**).

Discussion

UAP is an acute heart disease, and the main source of its pain is the rupture of atherosclerotic plaques. Such ruptures are prone to cause thrombosis, which leads to the blockage of small vessels, more serious complications, and higher mortality rates [15, 16]. Even after treatment, patients receiving improper late nursing still have a higher risk of angina pectoris. Therefore, for UAP patients, taking appropriate nursing measures after first-aid measures can relieve their symptoms, ensure the effectiveness of the first-aid measures and life safety at the same time [17].

Predictive nursing, a new nursing method derived from evidence-based medicine, can provide scientific and effective nursing for patients according to their illnesses and physical conditions [18]. In our research, after the nursing, the improvement of the clinical symptoms and electrocardiogram results were better in the OG, and the improvement of stable states and attacks of angina pectoris was also remarkably better in this group. This suggests that the implementation of predictive nursing helps improve the patients' therapeutic effects. This is possibly related to the improvement of the patients' negative emotions and treatment compliance. Therefore, we compared the improvement in the negative emotions and the treatment compliance after the nursing. After

the nursing, the patients' depression and anxiety in both groups was improved, but the improvement was more significant and the treatment compliance was also significantly better in the OG. During the implementation of predictive nursing, we took a series of helpful measures to improve emotions and the treatment compliance, such as explaining angina pectoris and relieving negative emotions. As reported by previous studies, effective nursing methods can improve the therapeutic effects in patients by relieving their negative emotions and improving their treatment cooperation [19]. This is consistent with our conclusions.

Next, we recorded and compared the changes in blood pressure and the occurrence of complications between the two groups. The blood pressure was remarkably improved, and the incidence of complications was remarkably lower in the OG. This indicates that the active and effective measures of predictive nursing can stabilize patients' blood pressure and reduce their risk of complications. According to some studies, the excessive fluctuation and instability of blood pressure further increases the risk of angina pectoris [20]. We believe that the improvement of treatment compliance is the reason for the more significant improvement of blood pressure in the OG. Through the guidance on and the interventions in diet and work and rest, healthy and scientific living habits of patients can be developed. This not only helps to relieve anxiety, but it also improves treatment compliance, stabilizes blood pressure and minimizes the risk of complications. The medical literature points out that predictive nursing can improve patients' blood pressure, thereby improving their therapeutic effects and reducing their risk of complications [21]. This also confirms our observation results. Finally, we compared the patients' QOL and nursing satisfaction after the nursing and found that the two indicators were both significantly better in the OG. This is because predictive nursing is significantly better than routine nursing at relieving symptoms and reducing the risk of complications, so it has a direct impact on patients' QOL. In the past, research [22] found that the application of scientific and effective nursing methods in UAP patients can effectively promote their recovery and improve their nursing satisfaction. The mechanism for this may involve a series of ways to improve patients' disease awareness, family support, anxiety, drug compliance, and other aspects of the nursing process, which is similar to our nursing plans.

In summary, for UAP patients, predictive nursing can improve their treatment compliance, therapeutic effects and QOL, thereby reducing the risk of complications. Hence, this nursing model is worthy of clinical promotion. However, this study also has certain limitations. For example, we did not compare the predictive care model with other similar care models, so whether it is the most appropriate care plan still needs to be further confirmed.

Disclosure of conflict of interest

None.

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