

Original Article

Predictive care improves quality of life and satisfaction in patients with AD

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Abstract: Objective: To explore the clinical effects of predictive nursing care procedures in nursing of patients with Alzheimer's disease (AD). Methods: Eighty patients with AD were enrolled in the study group or the control group. There were 40 patients in each group. The control group received routine care and the study group received care from a predictive care program (including prevention of falling bed, infection, pressure sores, constipation, and sleep disorders). Patient satisfaction with nursing care, quality of life assessments, and incidences of complications were compared between the two groups. Results: Before nursing care, there was no statistically significant difference in the clinical data between the two groups ($P > 0.05$). After nursing care, patient satisfaction and intervention efficacy were significantly higher in the study group than in the control group, and the difference in intervention efficacy was significant ($P < 0.001$). The proportions of fractures, urinary system syndrome, gastrointestinal diseases, and respiratory tract infections were lower in the study group than in the control group, and the differences between the two groups were statistically significant (all $P < 0.05$). The QQLAD, ADL, and MMSE scores were statistically significantly higher in the study group than in the control group ($P < 0.001$). Intra-group comparisons of QQLAD, ADL, and MMSE scores were performed for the study and control groups. The QQLAD, ADL, and MMSE scores after nursing care were statistically significantly higher than the corresponding pre-care QQLAD, ADL, and MMSE scores ($P < 0.001$). Conclusion: The use of predictive nursing care procedures effectively improved quality of life and satisfaction of patients with AD.

Keywords: Predictive nursing, AD, quality of life, nursing satisfaction

Introduction

Alzheimer's disease (AD) is the most common type of dementia in the elderly [1]. It is a degenerative central nervous system disease with chronic progression and not easily detected in the early stage. It usually occurs after 56 years of age and occurrence peaks at 78 years of age. AD develops slowly; patients with a family history of AD develop the disease more quickly [2, 3]. Patients with AD may have cognitive dysfunction, personality changes, progressive memory impairments, language disorders, mental disorders, and abnormal behaviors, and difficulty with or even an inability to perform basic self-care. It constitutes great threats to the life functions and socialization of the elderly [4-8]. As life expectancy continues to increase, health issues related to aging are becoming more

prevalent worldwide. The prevalence of senile AD is 4% to 6%. The complications are numerous and the nursing care is extremely difficult. Prevention of this disease is very important in the elderly.

Predictive care, also called advanced care, is a special nursing care concept. The principles are to prevent post-prevention, that is, to improve the predictability of problems that may occur during the nursing process, and to detect and solve the patient's nursing problems in a timely manner to improve treatment effects [9]. Predictive care can delay the progression of AD symptoms and declines in patients' physiological functions, improve the self-care abilities of the elderly, increase the duration that the elderly can take care of themselves, and improve quality of life of the elderly [10, 11]. Predictive

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care uses advanced care methods to analyze all aspects of the lives of patients with AD. It can anticipate possible adverse events and complications in patients; adapt different, effective, and timely solutions to different patient situations; avoid adverse events and complications during the care program; and improve patients' quality of life [12]. However, there are few studies on the different clinical effects between predictive care and routine care in nursing of patients with AD.

This study explores the efficacy of predictive care in improving quality of life and satisfaction in patients with AD.

Materials and methods

General clinical data

The study has been approved by the ethics committee of our hospital, and patients and their families are informed in advance before the study. Patients volunteered to cooperate and signed informed consent. Inclusion criteria: All patients were scored 8~22 points on the Mini-Mental State Scale (MMSE) and met the diagnostic criteria for international dementia guidelines. Exclusion criteria: Patients with vascular dementia or/and with neuropsychiatric diseases such as epilepsy were excluded.

Eighty patients with AD who had been admitted to our hospital from January 2016 to January 2018 were divided randomly into the study group and the control group. There were 40 patients in each group. In the study group, there were 28 men and 12 women with an age range of 59 to 88 years and an average age of 69.57 ± 1.94 years; the disease course ranged from 2 to 8 years with a mean duration of 4.73 ± 0.97 years. In the control group, there were 29 men and 11 women with an age range of 60 to 88 years and an average age of 70.17 ± 1.44 years; the disease course ranged from 2 to 8 years with a mean duration of 4.87 ± 0.96 years.

Nursing methods

After the two groups had received one month of predictive care in the hospital, the medical staff conducted nursing education for AD patients and their family members or caregivers to ensure continuous care. The patients were followed up for 6 months. The control group received routine care, including routine daily care, assisting and urging patients to take

medicine, taking care of patients during activities, correct health guidance and reasonable diet care. The study group received predictive care as follows.

Care for the prevention of falling out of bed

Patients with AD have poor autonomy and are unable to cope with challenges in daily life. They often fall down and fall out of bed.

In order to prevent falls in elderly patients with AD, the personnel who provided relevant care should always be vigilant and check on the elderly at regular intervals to avoid complications caused by falling down or falling out of bed, and so on. The relevant nursing staff and their families had to provide full day care for patients with AD. They could arrange care times and assist each other to ensure that the patients were not allowed to be alone. The living space of patients with AD was cleaned regularly to avoid restricting the area of the patient's activity; bed rails had to be adjusted properly before the patient went to sleep to minimize the incidence of falling out of bed.

Care for the prevention of infection

Patients with AD are affected by somatic limitations and their immune resistance is weak. Because of AD, patients cannot cope with their daily lives in a timely manner, such as wearing more clothes according to seasonal climate changes. Thus, they become cold easily, which makes them prone to respiratory infection. Therefore, the nursing staff should take corresponding preventative measures: (1) pay attention to ventilation and disinfection of the patient's living environment and ensure that the indoor temperature maintains between 19-24°C and that the humidity between 62% and 72%; if the patient has sputum production, instruct and encourage the patient to effectively drain the sputum, and if necessary, perform suction; the nursing staff should perform body position drainage, that is, turn the patient over to help with sputum drainage; (2) supervise patients to drink enough water and eat digestible food; and (3) in cases of serious infection, suction should be performed for the patient at all times, and if necessary, tracheal intubation or aerosol therapy should be performed.

Care for the prevention of pressure sores

Because a small number of patients with AD had essentially lost their ability to move autono-

mously; mobility was inconvenient; their position in bed did not change over a long duration. As these patients were more likely to develop pressure sores, caregivers should avoid long-term compression of local tissue, that is, they should turn the patient over regularly and pay attention to excreta cleaning. When replacing patients' sheets, they should avoid standard practices such as dragging, pulling, pushing, and so on.

Care for the prevention of constipation

Most elderly persons have problems with constipation. Older people with AD have insufficient abilities to care for themselves, so they need more professional constipation care. In this study, relevant caregivers had to pay attention to the patient's intake of foods that were rich in cellulose, such as brown rice and seeds, as well as fruits, vegetables, soybeans, and wheat bran. While increasing the intake of dietary fiber, the amount of drinking water should also be increased; the optimal daily water intake was 1,500-2,500 mL. Patients with severe constipation were supplemented appropriately with probiotics. After three meals, caregivers massaged the patient's abdomen for 10-15 minutes. When severe constipation occurred, the patient was given qualified dialysis medication or glycerin enema treatment as directed by a doctor. In case of traditional Chinese medicine, elderly patients could ingest mulberry to reduce constipation; the specific method was to take 50 grams of mulberry, add 500 mL of water, boil until 250 mL remained, and add an appropriate amount of sugar. The above was the dose for 1 day; one course of treatment was one dose per day for 5 days.

Care for the prevention of sleep disorder

In general, people with AD have different degrees of difficulties in sleep disorders, so it is important to schedule the patient's bedtime reasonably. Relevant caregivers adjusted the patient's sleep schedule by encouraging them to participate in healthy and interactive social activities during the day. The nursing staff should pay attention to changes in the patient's mood. When the patient's mood fluctuated greatly, it was necessary to obtain treatment in a timely manner. Patients with AD and those with severe sleep disorders were treated as prescribed. The average patient with AD could not sleep for more than 30 minutes during the

day; patients were taught to relax and promote sleep before going to bed at night.

Outcome measures

Primary indicators: After one-month and 6-month care, quality of life of patients was scored in the two groups using the Quality of Life Core Scale (QOL-C30) [13].

Secondary indicators: Intervention efficacy and patients' satisfaction, and the incidence of complications (including fractures, urinary tract syndrome, gastrointestinal diseases, respiratory infections) were studied in the nursing group and the control group after 6 months of care.

Quality of life assessment

After 6 months of follow-up, the patients were evaluated with the QOL-C30 comprises the Quality of Life Scale (QQLAD), Activity Ability Scale (ADL), and Mini-Mental State Examination (MMSE). The questionnaire in QQLAD, ADL and MMSE was designed to measure patients' physical, psychological and social functions. The response to each scale of a particular dimension was transformed into a score between 0 and 100. For fatigue, dyspnea, and diarrhea, 100 was the worst score, whereas for global health, physical functioning, and role functioning, 100 was the best score [14].

Statistical methods

The statistical analysis was performed using SPSS, version 20.0 (Asia Analytics, formerly SPSS China). Measurement data are represented by $\bar{x} \pm S$. Paired t-tests were used to compare data of the same group at different time points while independent sample t tests were used for comparison between the two groups at the same time points.

Count data are analyzed by using the χ^2 test. When $P < 0.05$, the difference was considered statistically significant.

Results

Comparisons of general clinical baseline data between the study group and control group

The clinical baseline data including sex, age, education level, presence or absence of thyroid disease, presence or absence of epilepsy, and a history of depression or AD were compared

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Table 1. General clinical baseline data of the study group and control group [n (%)]

Group		Study group (n = 40)	Control group (n = 40)	X ²	P
Gender	Male	28 (70.00)	29 (72.50)	0.061	0.805
	Female	12 (30.00)	11 (27.50)	0.061	0.805
Age	59~69	10 (25.00)	11 (27.50)	0.065	0.799
	70~79	14 (35.00)	12 (30.00)	0.228	0.633
	80~88	16 (40.00)	17 (42.50)	0.052	0.820
Education level	High	15 (37.50)	16 (40.00)	0.053	0.819
	Low	25 (62.50)	24 (60.00)	0.053	0.819
Thyroid disease	Have	21 (52.50)	20 (50.00)	0.050	0.823
	No	19 (47.50)	20 (50.00)	0.050	0.823
Epilepsy	Have	10 (25.00)	9 (22.50)	0.069	0.793
	No	30 (75.00)	31 (77.50)	0.069	0.793
History of depression	Have	5 (12.50)	4 (10.00)	0.125	0.724
	No	35 (87.50)	36 (90.00)	0.125	0.724
Type of dementia	Senile dementia	30 (75.00)	31 (77.50)	0.069	0.793
	Vascular dementia	5 (12.50)	6 (15.00)	0.105	0.745
	Other types of dementia	5 (12.5028)	3 (7.50)	0.556	0.456

Table 2. Comparison of treatment efficiency and patient satisfaction between the study group and the control group [n (%)]

Group	n	Effective treatment	Patient satisfaction
Study group (n = 40)	40	33 (82.50)	39 (97.50)
Control group (n = 40)	40	10 (25.00)	15 (37.50)
X ²		26.60	32.82
P		< 0.001	< 0.001

between the study group and the control group. The results showed no significant difference in the clinical data between the two groups ($P > 0.05$) (**Table 1**).

Comparisons of intervention efficacy and patient satisfaction between the study group and control group

According to follow-up surveys of the study and control groups, the intervention efficacy in the study group was 82.50%, which was higher than 25.00% of the control group; the difference between the two groups was statistically significant ($P < 0.001$). The patient satisfaction in the study group was 97.50%, which was higher than 37.50% of the control group. There were statistical differences between the two groups ($P < 0.001$) (**Table 2**).

Complications in the study and control groups

After predictive care, the total number of complications in the study group was lower than

that after routine care in the control group, and the difference was statistically significant ($P < 0.001$). The proportions of fractures, loss, urinary system syndrome, gastrointestinal disease, and respiratory infection complications were statistically significantly lower in the study group than those in the control group ($P < 0.05$) (**Table 3**).

Comparisons of QQLAD, ADL, and MMSE scores between the study and control groups

The QQLAD scores in the study group were 22.45 ± 4.78 and 56.28 ± 4.79 before and after treatment, respectively. The QQLAD scores in the control group were 22.37 ± 4.72 and 44.76 ± 3.03 before and after treatment, respectively. The difference in the QQLAD scores between the study and control groups was not statistically significant before nursing care ($P > 0.05$). The QQLAD score in the study group was statistically significantly higher than that in the control group after nursing care ($P < 0.001$). The pre-treatment QQLAD score was statistically significantly higher in the study group than in the control group ($P < 0.001$) (**Figure 1**).

The MMSE scores in the study group were 18.46 ± 4.36 and 27.38 ± 3.74 before and after treatment, respectively. The MMSE scores in the control group were 18.52 ± 4.20 and

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Table 3. Complications of the study group and the control group [n (%)]

Complication group	Study group (n = 40)	Control group (n = 40)	χ^2	P
Fracture	0	4 (10.00)	4.211	0.040
Lost or lost	0	9 (22.50)	10.14	0.002
Urinary system syndrome	1 (2.50)	7 (17.50)	5.00	0.025
Gastrointestinal disease	1 (2.50)	6 (15.00)	3.914	0.048
Respiratory infection	0	7 (17.50)	7.671	0.006
Total	2 (5.00)	33 (82.50)	48.810	< 0.001

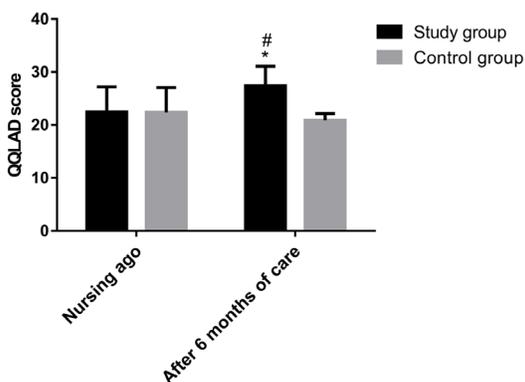


Figure 1. The difference in QQLAD scores before nursing was not statistically significant between the study group and the control group ($P > 0.05$). Compared with the QQLAD score of the control group, the QQLAD score of the study group was statistically significantly higher ($P < 0.001$). (Note: *indicates that the QQLAD score of the study group was significantly higher than that of the control group after nursing; #represents the scores of study group was significantly higher than that before nursing care, and the difference was statistically significant ($P < 0.001$)).

20.89 \pm 1.26 before and after treatment, respectively. There was no significant difference in MMSE scores between the study group and control group before treatment ($P > 0.05$). The MMSE score in the study group was statistically significantly higher than that in the control group after treatment ($P < 0.001$). The pre-treatment MMSE score was statistically significantly higher in the study group than in the control group ($P < 0.001$) (**Figure 2**).

The ADL scores in the study group were 25.08 \pm 9.74 and 61.14 \pm 10.76 before and after treatment, respectively. The ADL scores in the control group were 25.12 \pm 10.08 and 41.05 \pm 8.65 before and after treatment, respectively. There was no significant difference in ADL scores between the study and control groups

before treatment ($P > 0.05$). The ADL score in the study group was statistically significantly higher than that of the control group after treatment ($P < 0.001$). The ADL scores after nursing were statistically significantly higher than those before nursing care ($P < 0.001$) (**Figure 3**).

Discussion

The number of geriatric diseases is increasing, and AD is one of the more common diseases [15]. AD has great impacts on the patient's health, quality of life, and family; it also exerts a tremendous burden on the social security system [16]. As the trend of global aging continues to accelerate, the number of patients with AD will increase at an increasing rate. In the early-onset period of the disease, the symptoms of AD are more insidious and not easily detected by the patient or his or her family, friends, and so on, which results in patients with AD missing the best treatment opportunities and worsens the symptoms [17, 18]. It has been reported that the cause of AD is related to family genetics, the autoimmune system, and the environment. However, the specific mechanisms causing symptoms of AD in patients are not completely understood, and there is no specific cure. Moreover, active care can play only a supporting role [19, 20]. Therefore, we should adopt more positive and appropriate methods to prevent AD in the elderly; in order to avoid missing an opportunity, patients who have been treated in time must be treated accordingly [21].

It has been reported that preventative treatment has achieved definite results as a clinical adjuvant therapy for patients with AD [22]. Predictive care is a comprehensive assessment of patients by scientific means, and adoption of a predictive care program turns passive care into active care. Therefore, it fully mobilizes the enthusiasm of the nursing staff to predict various unknown conditions that may occur in the patient, promote early nursing intervention to avoid the occurrence of adverse events, reduce risks, and improve the prognosis of AD through the implementation of various preventative measures [23, 24].

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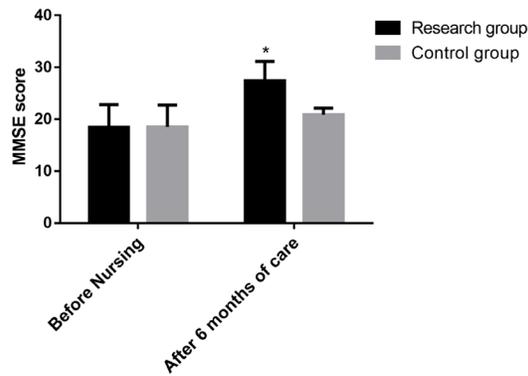


Figure 2. There was no significant difference in the MMSE scores before treatment between the study group and control group ($P > 0.05$). Compared with the MMSE score of the control group, the MMSE score of the study group was statistically significantly higher ($P < 0.001$). (Note: *indicates that the MMSE score of the study group was significantly higher than that of the control group after nursing ($P < 0.001$)).

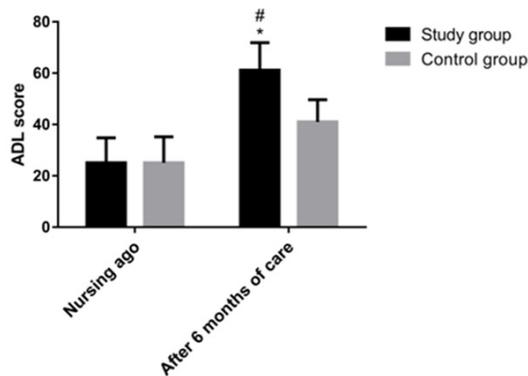


Figure 3. There was no significant difference in the ADL scores before treatment between the study group and the control group ($P > 0.05$). Compared with the ADL score of the control group, the ADL score of the study group was statistically significantly higher ($P < 0.001$). (Note: *indicates that the ADL score of the study group was significantly higher than that of the control group after nursing care; #represents the scores of study group was significantly higher than that before nursing care, and the difference was statistically significant ($P < 0.001$)).

The results showed that the differences in the baseline clinical data were not statistically significant between the two groups. Next, we compared intervention efficacy and patient satisfaction between patients who received predictive care and those who received routine care. The follow-up survey showed that the efficacy in patients who received predictive nursing care was 82.50%, which was statistically significantly higher than that in patients who received

conventional nursing ($P < 0.001$). The patient satisfaction rate among patients who received predictive nursing care was 97.50%, which was statistically significantly higher than 37.50% of those who received routine nursing care ($P < 0.001$). Moreover, in a great number of related reports, it was noted that intervention efficacy and patient satisfaction were statistically significantly higher in elderly patients with AD who received predictive care than in those who received conventional care ($P < 0.05$) [25, 26].

Next, we calculated the incidences of complications in patients with AD after predictive and routine care. The incidences of fractures, loss, urinary system syndrome, gastrointestinal diseases, and respiratory tract infections were statistically significantly lower among patients with AD who received predictive care than among those who received routine care. The number of complications in the control group was statistically significantly higher ($P < 0.05$). The impacts of different nursing methods on AD complications have been reported. There are reports that in patients with AD, the effects of predictive nursing care are better at reducing complications than those of conventional care, which supports our findings [15, 27].

Finally, we compared the QQLAD, ADL, and MMSE scores between patients with AD who received predictive care and those who received routine care. The follow-up results showed that the QQLAD, ADL, and MMSE scores in patients with AD who received predictive nursing were statistically significantly higher than in those who received routine nursing care ($P < 0.001$). The QQLAD, ADL, and MMSE scores of patients with AD after receiving predictive nursing care were compared with those of patients with AD after receiving routine nursing care. The QQLAD, ADL, and MMSE scores after nursing care were statistically significantly higher than the corresponding pre-care scores. The differences in the ADL and MMSE scores were statistically significant ($P < 0.001$). There are reports of no significant clinical differences in similar studies comparing predictive with routine care in two groups of patients with AD. A 1-year follow-up survey was administered by researchers to the two groups of patients and measured QQLAD, ADL, and MMSE scores. The results of the survey showed that the QQLAD, ADL, and MMSE scores of patients with AD

were statistically significantly higher after predictive care than after conventional care ($P < 0.001$); this is consistent with our findings [27].

In this study, there were not enough data for statistical analysis because the number of included subjects was too small, which may have compromised the results. To address this problem, we will continue to increase the number of research subjects in the future to continuously improve the research.

In summary, satisfaction and quality of life of patients with AD were significantly higher after predictive care than after routine care, and predictive care greatly reduced the incidence of complications, which greatly improved the prognoses of patients with AD. Therefore, we believe that predictive care is worthy of widespread use in Alzheimer's care; this is of great significance to patients and their families and could even reduce the burden on the social security system.

Disclosure of conflict of interest

None.

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