

Review Article

Health education can improve psychological pressure and sleep quality of patients with gestational hypertension

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Abstract: This study set out to explore the effect of health education on psychological pressure and sleep quality of patients with gestational hypertension. Ninety-two patients with gestational hypertension admitted to our hospital from November 2017 to September 2019 were selected as the research subjects. Among them, 50 patients received health education and were regarded as the research group (RG), and 42 patients received conventional nursing and were regarded as the control group (CG). The changes in blood pressure level and pregnancy outcomes were compared between the two groups. The psychological state of the patients was evaluated by a self-rating anxiety scale (SAS) and self-rating depression scale (SDS). The sleep status of patients in both groups was evaluated by Pittsburgh Sleep Quality Index (PSQI) and their nursing satisfaction was investigated upon discharge from hospital. There was no remarkable difference in blood pressure level between the two groups before intervention ($P > 0.05$). After intervention, systolic and diastolic pressure levels in the RG were dramatically lower than those in the CG ($P < 0.05$). The incidence of adverse pregnancy outcomes in the RG was significantly lower than that in the CG ($P < 0.05$). There was no marked difference in the SAS, SDS and PSQI scores between both groups before intervention ($P > 0.05$). After that, those scores were remarkably lower than before intervention ($P < 0.01$), and the RG was remarkably lower than the CG ($P < 0.01$). At the same time, the nursing satisfaction of the patients in the RG was higher than those in the CG ($P < 0.05$). Health education can significantly improve psychological pressure and sleep quality of patients with gestational hypertension, reduce blood pressure, improve pregnancy outcomes and improve patient satisfaction, which is worthy of promotion and application in clinical practice.

Keywords: Health education, gestational hypertension, psychological pressure, sleep quality, nursing

Introduction

Hypertension has a high incidence among the middle-aged and the elderly, and gestational hypertension is a kind of pregnancy-specific disease that occurs in women during pregnancy due to factors such as body function, and diet, etc. It is more common in pregnant women after 20 weeks of gestation and poses a certain threat to the life and health of pregnant women and fetuses [1, 2]. The clinical manifestations of gestational hypertension include proteinuria, edema, hypertension, etc. Severe cases may lead to convulsions, coma and even maternal or fetal death [3]. In recent years, the prevalence rate of gestational hypertension has shown an upward trend. According to statistics of Umesawa M et al. [4], the morbidity

of gestational hypertension is 1.8%-4.4%. Gestational hypertension is the main cause of morbidity and mortality in pregnant women and in the prenatal period, and is a major global health problem [5, 6]. Therefore, due to the fear of disease and the need for the safety of oneself and children, patients often suffer from severe psychological burdens, anxiety and fear; and negative emotions excite sympathetic nerves, causing contraction of micro blood vessels throughout the body, a further increase of blood pressure, and easy occurrence of dystocia and postpartum hemorrhage [7]. In the meantime, some studies show that patients with gestational hypertension are more prone to have sleep disorders than normal pregnant women, and poor sleep will promote an increase of blood pressure [8]. Hence, how to effectively

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reduce psychological pressure and improve sleep quality is currently a hot topic in clinical research. Health education is a cognitive method to improve health knowledge in a planned, organized and systematic way, and it has developed from the education of disease to health education about psychology and society. Implementing health education for patients can enable them to have a better understanding of the disease, enhance their self-care awareness, and help relieve and eliminate psychological pressure, so as to improve treatment efficacy and their prognosis [9]. As can be seen from the research of Chawla SPS et al. [10], effective health education can improve knowledge, attitude and habits, especially in lifestyle changes and diet management, and can better control blood glucose, thus slowing down the progression of diabetes and preventing complications. Besides, Chang SF et al. [11] have pointed out that health education can reduce the anxiety of mothers of children undergoing circumcision. Meanwhile, some studies have confirmed that health education intervention based on a positive healthy belief mode can significantly improve the blood pressure control of hypertension patients in a community environment [12]. Therefore, we speculate that this method can also reduce the psychological pressure of gestational hypertension and improve sleep quality. We carried out experimental analysis, aiming to provide references and guidance for future clinical services.

Data and methods

General information

Ninety-two patients with gestational hypertension admitted to Xinhua Hospital from November 2017 to September 2019 were selected as the research subjects. Among them, 50 patients received health education and were regarded as the research group (RG) and 42 patients who received conventional nursing were regarded as the control group (CG). This experiment was approved by the ethics Committee of Xinhua Hospital and was in accordance with the Helsinki Declaration. All the research subjects understood the nursing content and signed an informed consent form.

Inclusion and exclusion criteria

Inclusion criteria were as follows: patients who met the diagnostic guidelines for gestational hypertension [13] and continued to be treated in our hospital after diagnosis.

Exclusion criteria were as follows: patients with essential hypertension; patients with other pregnancy complications; patients with other cardiovascular and cerebrovascular diseases; patients with mental diseases who could not cooperate with treatment and nursing; patients with poor treatment compliance; and patients with incomplete clinical data.

Methods

Intervention plans of the CG: We checked the patients' vital signs on a regular basis every day, instructed them to take their medicine on time, tried to meet their needs, explained to them the difficult problems of the disease, and assisted them to complete the treatment.

Intervention plans of the RG: 1. Disease knowledge education: We distributed a health knowledge education manual or watched a disease propaganda video so as to introduce the relevant knowledge of the disease in easy-to-understand language, and answered disease knowledge questions with patients in the form of question-and-answers after the education, so that they could have a comprehensive understanding of gestational hypertension. 2. Diet and drug education: We instructed patients to eat low sodium and high protein foods, eat reasonably and strengthen nutrition, explained drug effects and adverse reactions during medication, and urged them to take drugs on time and notify doctors immediately if they feel uncomfortable. 3. Mental health education: We strengthened communication with patients, paid attention to their psychological changes at all times, and guided them to maintain emotional stability by listening to light music and other methods. 4. Detection of illness changes: We instructed patients to learn to self-test for fetal movement and heart rate, strengthened patrolling, paid close attention to changes in their vital signs, and notified doctors immediately if there was any abnormality.

Outcome measures

Comparison of blood pressure level and pregnancy outcome between the two groups before and after intervention: Mental state: was evaluated via Self-rating Anxiety Scale (SAS) and Self-rating Depression Scale (SDS), and the higher the score was, the worse the mental state was. Sleep quality: Sleep conditions were evaluated via Pittsburgh Sleep Quality Index (PSQI), including quality, latency, time and efficiency; the higher the score was, the worse the

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Table 1. Comparison of clinical data [n (%)]

	Research group (RG) (n=50)	Control group (CG) (n=42)	t or χ^2	P
Age (years)	26.58±5.25	25.74±5.13	0.772	0.442
BMI	28.21±3.67	28.65±3.84	0.561	0.576
Gestational week	27.58±3.21	28.21±3.65	0.881	0.381
Severity			0.165	0.921
Mild	19 (38.00)	17 (40.48)		
Moderate	25 (50.00)	21 (50.00)		
Severe	6 (12.00)	4 (9.52)		
Maternity type			0.224	0.636
Primipara	31 (62.00)	24 (57.14)		
Multipara	19 (38.00)	18 (42.86)		
Education level			0.058	0.809
High school and below	13 (26.00)	10 (23.81)		
Above high school	37 (74.00)	32 (76.19)		
Place of residence			0.216	0.642
Cities and towns	31 (62.00)	28 (66.67)		
Countryside	19 (38.00)	14 (33.33)		
Smoking			0.519	0.471
Yes	10 (20.00)	6 (14.29)		
No	40 (80.00)	36 (85.71)		

sleep quality was. When leaving hospital, they filled out a nursing satisfaction questionnaire (anonymous investigation). It included the satisfaction degree of nursing staff, evaluation of nursing ability and self-benefits, etc. It was a percentile system: very satisfied (>90 points), satisfied (80-90 points), need improvement (60-79 points), dissatisfied (<60 points), satisfied = (very satisfied + satisfied)/total number of cases × 100%.

Statistical methods

The collected data were statistically analyzed via SPSS 24.0 (Shanghai Yuchuang Network Technology Co., Ltd.), and the required figures were drawn via GraphPad 5. The counting data were expressed in the form of (rate), and comparison between groups was done under the Chi-square test. The measurement data were expressed in the form of (mean±standard deviation), and comparison between groups adopted a t test. $P < 0.05$ showed that the difference was statistically significant.

Results

Comparison of general data

After comparing the age, BMI, gestational age, severity, maternity type, educational level, place of residence and smoking of pregnant wo-

men in the two groups, we found no remarkable difference ($P > 0.05$), proving that the groups were comparable (**Table 1**).

Comparison of blood pressure level

There was no obvious difference in blood pressure level between the two groups before intervention ($P > 0.05$). After implementing different measures, the systolic pressure and diastolic pressure levels in the RG were significantly lower than those in the CG ($P < 0.05$), as shown in **Table 2**.

Comparison of pregnancy outcomes

The incidence of postpartum hemorrhage, premature delivery, premature rupture of membranes and maternal death in the RG were dramatically lower than those in the CG ($P < 0.05$), as shown in **Table 3**.

Assessment of mental state

There was no remarkable difference in the scores of the two groups before intervention ($P > 0.05$). After implementing different intervention measures, the SAS and SDS scores of both groups were significantly lower than before nursing ($P < 0.01$), and the RG was significantly lower than the CG ($P < 0.01$), as shown in **Figure 1**.

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Table 2. Comparison of blood pressure levels of patients between the two groups (mmHg)

Group	Number of cases	Diastolic pressure		Systolic pressure	
		Before intervention	After intervention	Before intervention	After intervention
Research group (RG)	50	98.64±6.81	84.82±5.19	154.43±10.26	131.25±6.57
Control group (CG)	42	98.22±6.54	88.65±5.73	152.89±9.78	135.76±7.41
t		0.300	3.362	0.733	3.094
P		0.765	0.001	0.466	0.003

Table 3. Comparison of pregnancy outcomes of pregnant women between the two groups [n (%)]

Group	Number of cases	Postpartum hemorrhage	Premature birth	Premature rupture of membranes	Maternal death	Total incidence (%)
Research group (RG)	50	2 (4.00)	4 (8.00)	2 (4.00)	0 (0.00)	16.00%
Control group (CG)	42	5 (11.90)	7 (16.67)	4 (9.52)	1 (2.38)	40.48%
χ^2						6.910
P						0.008

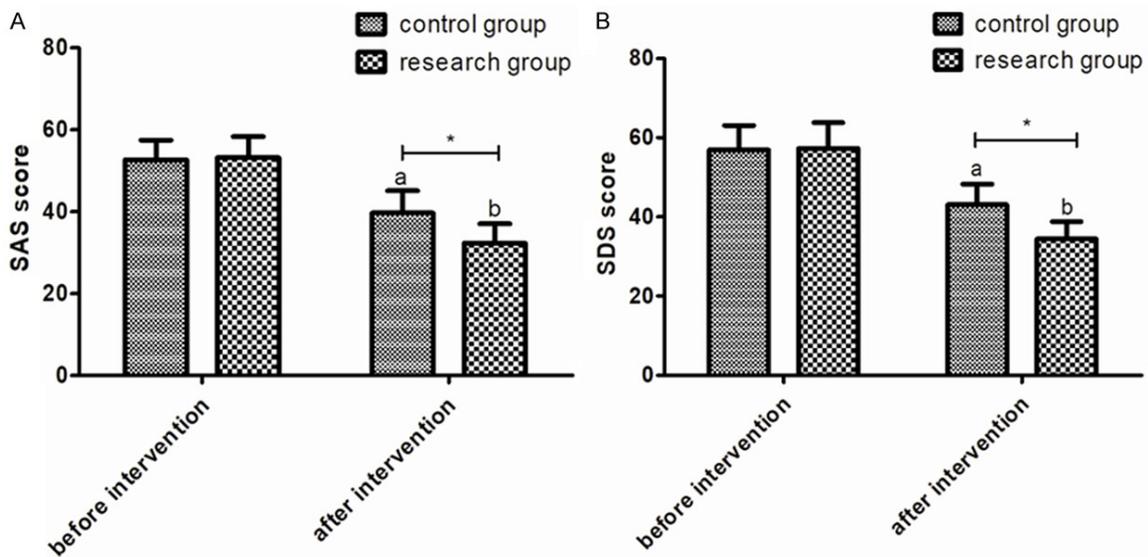


Figure 1. Comparison of assessment of mental state of patients between the two groups. A. Comparison of SAS scores. B. Comparison of SDS scores (* $P < 0.01$). A indicates comparison with the CG before intervention ($P < 0.01$); B indicates comparison with the RG before intervention ($P < 0.01$).

Comparison of sleep quality

There was no remarkable difference in the PSQI scores of sleep quality between the two groups before intervention ($P > 0.05$). The scores of the RG were significantly lower than those of the CG after intervention ($P < 0.01$), and the scores of both groups were dramatically lower than those before intervention ($P < 0.01$) (Table 4).

Comparison of nursing satisfaction

When discharged from hospital, the patients received a survey on the nursing satisfaction.

The results showed that the total nursing satisfaction of the RG was 92.00%, significantly higher than that of the CG (71.43%) ($P < 0.05$). In the RG, 62.00% (31 cases) of patients were very satisfied, 30.00% (15 cases) were satisfied, 8.00% (4 cases) reported needed improvement, and the number of dissatisfied cases was 0. In the CG, 23.81% (10 cases) of patients were very satisfied, 47.62% (20 cases) were satisfied, 21.43% (9 cases) said needed improvement, and 7.14% (3 cases) were dissatisfied. Most of the subjects in the RG were very satisfied, while most of those in the CG were satisfied (Table 5).

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Table 4. Comparison of PSQI scores of sleep quality

		Research group (RG) (n=50)	Control group (CG) (n=42)	t	P
Before intervention	Sleep quality	2.21±0.57	2.17±0.52	0.349	0.728
	Sleep latency	2.29±0.61	2.23±0.58	0.481	0.632
	Sleep time	1.44±0.52	1.41±0.50	0.281	0.780
	Sleep efficiency	1.25±0.43	1.19±0.36	0.717	0.475
After intervention	Sleep quality	1.21±0.39 [#]	1.49±0.52 [#]	2.947	0.004
	Sleep latency	1.31±0.41 [#]	1.64±0.59 [#]	3.153	0.002
	Sleep time	0.76±0.24 [#]	0.95±0.28 [#]	3.505	0.001
	Sleep efficiency	0.54±0.18 [#]	0.83±0.22 [#]	6.955	0.000

[#]indicates comparison with before intervention (P<0.01).

Table 5. Comparison of nursing satisfaction [n (%)]

	Research group (RG) (n=50)	Control group (CG) (n=42)	χ^2	P
Very satisfied	31 (62.00)	10 (23.81)		
Satisfied	15 (30.00)	20 (47.62)		
Need improvement	4 (8.00)	9 (21.43)		
Dissatisfied	0 (0.00)	3 (7.14)		
Overall satisfaction	46 (92.00)	30 (71.43)	6.724	0.010

software and strict screening according to inclusion and exclusion criteria, followed a rigorous scientific research spirit, explored the influence of health education on psychological state and sleep quality of pregnant women with gestational hypertension, which is quite significant for clinical nursing of such diseases.

Discussion

Gestational hypertension is a disease with high incidence among pregnant women. Recently, with an increase in obesity and the number of elderly pregnant women, the number of gestational hypertension cases has shown a rising trend [14]. It can not only reduce the antioxidant capacity and immunity of pregnant women, but also cause fetal blood supply insufficiency, resulting in a coma, convulsions, and even multiple organ failure of the pregnant women [15]. Another study shows that [16], gestational hypertension is one of the crucial causes of premature delivery and intrauterine growth retardation, and even leads to the death of pregnant women or perinatal infants in severe cases. Clinically, for the treatment and nursing of gestational hypertension, the nursing staff not only need to carry out conventional nursing practices for patients, but also need to pay special attention to their psychological state. Blood pressure of pregnant women with gestational hypertension is higher than normal, and good psychological state and high quality sleep are helpful to improve maternal and infant outcomes [17]. At the moment, there is little research on psychological nursing intervention for pregnant women with gestational hypertension throughout the world. However, this experiment, through advanced statistical

Systolic pressure was ≥ 140 mmHg and diastolic pressure was ≥ 90 mmHg in patients with gestational hypertension. This experiment revealed that blood pressure levels between the two groups before intervention increased remarkably and there was no marked difference in blood pressure level between the two groups before intervention. After different intervention measures, systolic and diastolic pressure of patients in the RG were significantly lower than those of CG. This showed that health education on diet, psychology and medication could effectively reduce the blood pressure levels of patients. By comparing the pregnancy outcomes of patients in the two groups, we found that the incidence of adverse pregnancy outcomes of those in the RG was 16.00%, significantly lower than the CG (40.48%). This showed that health education had better clinical effects than conventional intervention. In hypertension, poor elasticity of blood vessels, small vasospasm, ischemia and hypoxia led to the occurrence of postpartum hemorrhage due to poor uterine contraction. There was no obvious difference in SAS, SDS and sleep quality between the two groups before intervention. However, after different intervention measures, the SAS and SDS scores of patients in the RG who received health education were dramatically lower than those in the CG who received conventional

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intervention, while the sleep quality was significantly higher than that of CG. This was also consistent with the results of Arora T et al. [18, 19] --- sleep education could improve sleep and minimize metabolic disorders and obesity in adolescents and psychological education intervention could effectively treat claustrophobia, which are both in agreement with the findings of our study. However, comparing the difference in nursing satisfaction of patients between the two groups, we also found that the nursing satisfaction in the RG implementing health education was significantly higher than that in the CG, suggesting that health education had higher clinical application value for pregnant women with gestational hypertension. The differences in experimental results between the two groups were estimated as follows: 1. Low sodium diet reduced the amount of extracellular fluid, resulting in a decrease in water content in the arteriole wall and a decrease in the resistance of surrounding tissues, thus causing a decrease in blood pressure [20]. 2. When patients suffered from fear, anxiety and other emotions or poor sleep conditions, sympathetic nerves were excessively excited, which led to faster heart rate, stronger myocardial contractility and increased cardiac output, thus keeping blood pressure at a high level [21, 22]. Health education enabled patients to have a certain understanding of diseases and relieve fear caused by unknown things. Meanwhile, changes in sleep state of patients were mainly caused by physiological and psychological reasons. Patients were psychologically comfortable and they slept well. It was helpful to maintain the stability of blood pressure. Hofmann SG et al. [23] discovered that health education reduced the severity of anxiety and depression symptoms in individuals seeking treatment. 3. By monitoring the regular medication of patients, we found a good interval of medication administration that was fixed to reduce blood pressure fluctuation. 4. We communicated with patients actively and effectively, comforted their moods, enabled them to establish a positive and optimistic state of mind and receive treatment at ease. Simultaneously, doctors and patients became closer, the overall impression of patients on medical personnel was improved effectively, the conflicts between doctors and patients were reconciled, and their trust of medical personnel was enhanced. The psychological burden of patients reduced and the natural sleep condition was significantly improved by health education and all-round nursing intervention.

This experiment aims to prove the application value of health education and nursing for pregnant women with gestational hypertension by comparing the differences between health education and conventional nursing intervention on psychological pressure and sleep quality. However, due to limited experimental conditions, there are still deficiencies. First, the sample base of the research subjects is small, so that big data cannot be statistically analyzed. Secondly, the research subjects are a narrow demographic so it is not excluded that health education may have different performance among pregnant women of different races. What's more, due to the short experimental period, it is impossible to evaluate the long-term impact of health education on patients. Last but not least, only conventional nursing intervention is used as a control, and the differences between this study and other nursing modes need further investigation. We will conduct a long-term follow-up survey on the subjects, continuously expand the sample size, improve the experimental design, and continue to explore the best nursing intervention mode for pregnant women with gestational hypertension, so as to obtain better experimental results.

To sum up, health education can significantly improve the psychological pressure and sleep quality of patients with gestational hypertension, reduce blood pressure, improve pregnancy outcomes and improve patient satisfaction, which is worthy of promotion and application clinically.

Disclosure of conflict of interest

None.

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