Original Article
The role of the humanoid diagram teaching strategy in the nursing of women undergoing caesarean section

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Abstract: Aim: To investigate the application of the humanoid diagram teaching strategy (HDTS) to the care of women undergoing caesarean section. Methods: 80 women undergoing caesarean section were recruited as the study cohort, with 37 patients who underwent caesarean section before the implementation of HDTS placed in the control group (CNG), and the other 43 cases, who underwent caesarean section after the implementation of HDTS, were placed in the study group (SG). We compared the two groups' incidences of postpartum complications, their pain levels, their negative moods, and their nursing satisfaction levels. Results: The total postoperative complication rates (uterine adhesions, infections, bleeding, etc.) were 2.33% in the SG and 16.22% in the CNG ($P<0.05$), and the pain levels were significantly lower in the SG than they were in the CNG ($P<0.05$). The self-assessment scale (SAS) and self-assessment scale (SDS) scores were lower in the SG than they were in the CNG ($P<0.05$). Meanwhile, 97.67% of the patients in the SG and 83.78% of the patients in the CNG were satisfied with the nursing care ($P<0.05$). Conclusion: HDTS helps to reduce the complication rate following caesarean section, improves the postoperative pain levels and adverse moods, and improves the patients' satisfaction levels with the nursing interventions, so it is of positive significance for the doctor-patient relationship and worthy of clinical promotion and application.

Keywords: Humanoid diagram teaching strategy, caesarean section, nursing, application

Introduction

With the introduction of China's two-child policy, there has been a gradual increase in the clinical application of caesarean section. Caesarean section is a procedure to remove tissue from inside the uterus. Doctors perform caesarean section to clear the uterine lining after a miscarriage or abortion [1]. In addition to being used to terminate pregnancies, caesarean section is often used in disease diagnosis and tissue sampling. However, caesarean section is an invasive procedure, and the patients inevitably experience postoperative pain and face the risk of infection [2, 3]. Caesarean section can be subdivided into two caesarean section: diagnostic caesarean section and therapeutic caesarean section, in which diagnostic caesarean section refers to removing the cervical canal or the contents of the uterine cavity through caesarean section and sending them for pathological examination to confirm cervical cancer,

endometrial cancer, or other malignant tumors of the uterus, while therapeutic caesarean section is mainly used for the early termination of pregnancies, incomplete abortions, retained placentas, molar pregnancies, and other conditions [4]. Caesarean section is an invasive procedure with certain risks and may cause postoperative complications [5].

HDTS is an emerging nursing model. It is an intervention method based on humanistic thinking and the "people-oriented" concept [6]. Evidence has shown that HDTS has satisfactory results when used in the nursing care of various diseases [7]. A study of 90 patients with cervical cancer found that HDTS significantly improved the patients' adverse postoperative moods, shorten the lengths of their hospital stays, reduce their perioperative medical costs, and had a positive significance for improving the patients' prognoses [8]. Another study found that HDTS improved the self-efficacy of
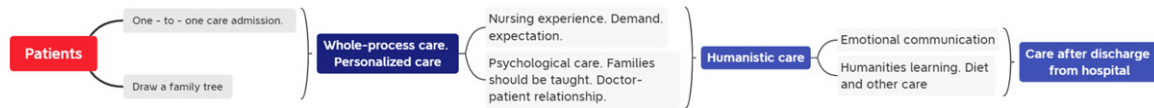
Figure 1. HDTS for caesarean section.

lung cancer patients in the perioperative period, enhanced the patients' confidence in the treatment, improved the patients' treatment compliance, and facilitated the implementation of medical interventions [9].

The purpose of this study was to analyze the feasibility of applying HDTS in the care of women undergoing caesarean section and its effects on their adverse emotions, postoperative complications, and satisfaction with the nursing care, aiming to provide clinical information for accelerating the recovery of women undergoing caesarean section and reducing the adverse emotions of women undergoing caesarean section.

Materials and methods

General information

Eighty women who underwent caesarean sections in our hospital from September 2019 to September 2020 were recruited as the study cohort. 37 women who underwent caesarean section prior to the implementation of HDTS were placed in the control group (CNG), and 43 women who received caesarean section after the implementation of HDTS were placed in the study group (SG). This study was approved by the ethics committee of our hospital. All the patients signed a written informed consent before participating in the study.

Inclusion criteria: (1) Women who needed an induced abortion and who underwent caesarean section. (2) Women between 18 and 35 years old. (3) Women with complete medical data. (4) Women with good treatment compliance. (5) Women who needed to be hospitalized after the operation.

Exclusion criteria: (1) Women with co-morbid psychiatric disorders. (2) Women with a history of previous caesarean section. (3) Women with co-morbid uterine fibroids. (4) Women with co-morbid malignancies. (5) Women with co-mor-

bid coagulopathies. (6) Women with co-morbid autoimmune system disorders.

Elimination criteria: (1) Women with poor compliance with the study procedures. (2) Women who voluntarily withdrew from the study.

Intervention methods

The caesarean section in the two groups was performed by the same group of physicians. During the perioperative period, the CNG underwent the conventional procedure, and the SG also underwent the conventional procedure but was additionally cared for using HDTS: (1) Training before the implement of the nursing. An HDTS group was established. Through literature searches, reviews of past cases, and dialogue with experienced nurses, the principles and procedures of HDTS were explained in detail. The key points regarding common complications and perioperative care were summed up (**Figure 1**). The key points were shared in group meetings. During the meetings, brainstorming was performed to perfect the treatment. (2) Drawing of humanoid diagrams. The humanoid diagrams are mainly composed of five parts: the patient's baseline data, the patient's characteristics (occupational characteristics, psychological characteristics, current treatment options), the history of the patient's diagnosis and treatment, family members, and laboratory examination results. The treatment options were plotted along the timeline as the horizontal axis. For example, patients undergoing caesarean section experience significant mood swings and prominent anxiety and depression symptoms on the day before the surgery. Psychological intervention and preoperative preparations should be done for the patients. The patients feel weak on the first day after the surgery, so nutritional supplements and anti-inflammatory therapy should be administered. The patient's physical condition gradually improves two days after the operation, but the pain level is more prominent. Pain intervention should be administered, and the patient's family should be encouraged to com-

Table 1. Comparison of the baseline data ($X \pm S$)/[n (%)]

General data		Study group (n=43)	Control group (n=37)	t/X^2	P
Average age (years)		30.19±2.33	29.98±2.54	0.386	0.701
Average week of pregnancy (weeks)		6.58±1.02	6.51±1.21	0.281	0.779
Average number of delivery		1.29±0.41	1.31±0.39	0.222	0.825
Average number of pregnancies		1.21±0.39	1.19±0.38	0.231	0.818
Average weight (kg)		64.49±3.44	65.18±3.29	0.913	0.364
Hypertension	Yes	4	7	1.551	0.213
	No	39	30		
Diabetes	Yes	8	6	0.079	0.779
	No	35	31		

municate with the patient to relieve their anxiety. Follow-up should be performed after the discharge to stay up-to-date with the patients' physical condition and to provide timely nursing guidance. (3) Revision of HDTS. The effects of HDTS were reviewed within the group after the patient's discharge, and necessary revisions were made, constantly improving the effect of the teaching.

Primary observation indicators

Postoperative complication rates: The incidences of complications, such as uterine adhesions, infections, and bleeding, in the patients after the caesarean section were compared between the two groups.

Comparison of the postoperative pain levels: The VAS was used to assess the postoperative pain at 1 h, 3 h, 12 h, and 24 h after the surgery. VAS is a straight horizontal line of fixed length, usually 10 cm, with 0 representing no pain and 10 representing severe pain, and the patients rate their pain level on the line [10]. 0-1: no pain, 2-4: mild pain, 5-8: moderate pain, and 9-10: severe pain.

Secondary observation indicators

Comparison of the patients' adverse moods: At 12 h and 24 h after the surgery, the SAS and SDS scales were used to assess the patients' anxiety and depression, and the differences between and within the groups were compared. The SAS scale is a 20-item self-reporting assessment tool built to measure patients' anxiety levels, based on the scoring of four groups of manifestations: cognitive, autonomic, motor and central nervous system symptoms. The higher the score, the more severe the anxiety

[11]. The SDS scale is a 20-item self-reporting questionnaire that is widely used as a screening tool that covers the affective, psychological and somatic symptoms associated with depression. A higher total score represents a more severe level of depression [12].

Patient satisfaction levels with the nursing interventions

A nursing satisfaction scale compiled by the hospital was used to evaluate the patients' satisfaction levels with the nursing intervention, covering five major areas, such as emergency services, daily health education, and out-of-hospital guidance, etc. The scale's total possible score was 100 points, with scores above 90 points indicating great satisfaction, 80-90 points indicating basic satisfaction, and 79 points and below indicating dissatisfaction, and the satisfaction rate = (great satisfaction + basic satisfaction)/total cases × 100%.

Statistical methods

SPSS 22.0 software was used to analyze the data, and a normal distribution test was carried out on the collected data. If the data conformed to the normal distribution, the count data were expressed as [n (%)] and compared using chi-square tests. The measurement data were expressed as (mean ± standard deviation) and compared using t-tests. P<0.05 indicated that a difference was statistically significant [13].

Results

Comparison of baseline data

The two groups' clinical data, including age, week of gestation, number of pregnancies, weight, family income, and underlying disease

Table 2. Comparison of the differences in the complication rates [n (%)]

Group	Cases	Uterine adhesions	Infections	Bleeding	Total incidence
Study group	43	0 (0.00)	0 (0.00)	1 (2.33)	1 (2.33)
Control group	37	2 (5.41)	1 (2.70)	3 (8.11)	6 (16.22)
X^2	-	-	-	-	4.806
P	-	-	-	-	0.028
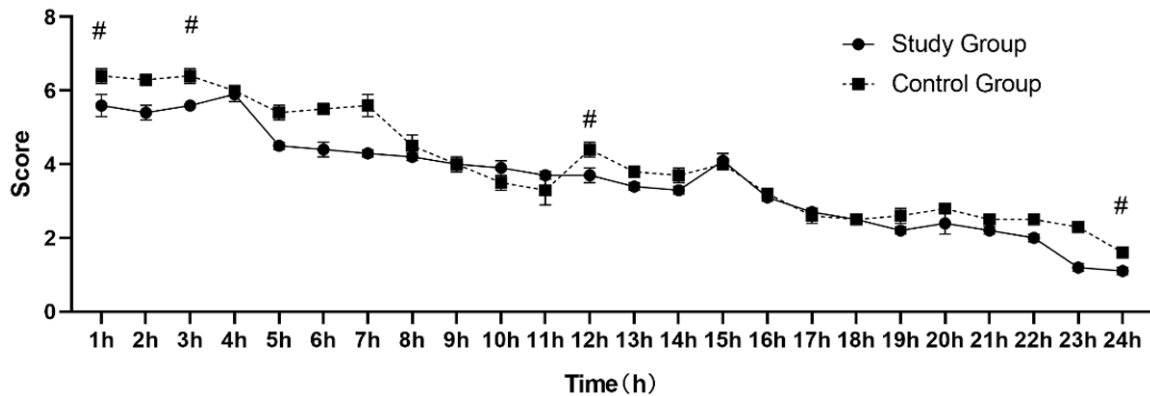
Figure 2. A comparative analysis of the postoperative pain. At 1 h, 3 h, 12 h, and 24 h after the surgery, the VAS scores of the study group were all lower than of the VAS scores in the control group ($P<0.05$). #represents a significant difference in the same index between the groups, $P<0.05$.

Table 3. Analysis of the postoperative pain rates [n (%)]

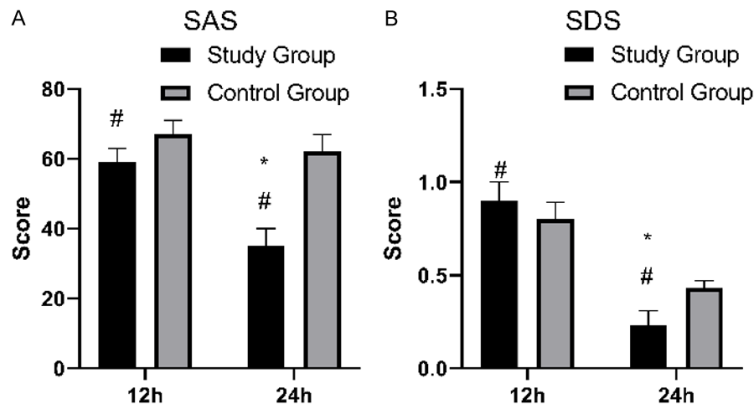| Grouping	Cases	Pain-free	Mild pain	Moderate pain	Severe pain
Study group	43	30 (69.77)	8 (18.60)	4 (9.30)	1 (2.33)
Control group	37	14 (37.84)	15 (40.54)	6 (16.22)	2 (5.41)
X^2	-	8.192	4.672	0.869	0.523
P	-	0.004	0.031	0.351	0.47

were not significantly different (P>0.05) so the two groups were comparable (**Table 1**).

Comparison of the differences in the complication rates

It was found that, among the patients in the SG, there was one case of vaginal bleeding after the surgery, for a total complication rate of 2.33% (1/43), and in the CNG, there were two cases of uterine adhesions, one case of infection, and three cases of bleeding after the surgery, for a total complication rate of 16.22% (6/37), and the difference between the two groups in terms of their total complication rates was significant (P<0.05) (**Table 2**).

Comparison of the postoperative pain

At 1 h, 3 h, 12 h, and 24 h after the surgery, the VAS scores in the SG were significantly lower than the VAS scores in the CNG (P<0.05)

(**Figure 2**). The percentage of pain-free patients in the SG was significantly higher than it was in the CNG (P<0.05) (**Table 3**).

Comparison of the adverse mood occurrences

Both the SAS and SDS scale scores were significantly decreased in the SG at 24 h postoperatively than they were at 12 h postoperatively, with significant before-and-after differences (P<0.05) (**Figure 3**).

Assessment of the nursing intervention satisfaction levels

40 patients in the SG were very satisfied with the nursing intervention, 2 were basically satisfied, and 1 was dissatisfied, for a satisfaction rate of 97.67%. 25 patients in the CNG were very satisfied, 6 were basically satisfied, and 6 were dissatisfied, for a satisfaction rate of 83.78%. The satisfaction rate in the SG was significantly higher than the satisfaction rate in the CNG (P<0.05) (**Table 4**).

Discussion

Caesarean section is widely performed in clinical practice. Women who undergo caesarean

Figure 3. Comparison of the adverse moods between the two groups. In terms of the SAS (A) and SDS (B) scores, the scores in the study group were lower than the scores in the control group at 12 h and 24 h after the surgery (*P*<0.05). The SAS and SDS scores in the study group at 24 h after the surgery were lower than they were at 12 h after the surgery (*P*<0.05). #denotes P<0.05 compared with the control group, and *denotes a significant difference within the same group.

Table 4. Assessment of the nursing intervention satisfaction levels [n (%)]

Grouping	Cases	Very satisfied	Generally satisfied	Unsatisfactory	Satisfaction
Study group	43	40 (93.02)	2 (4.65)	1 (2.33)	42 (97.67)
Control group	37	25 (67.57)	6 (1.62)	6 (16.22)	31 (83.78)
X^2	-				4.806
P	-				0.028

section to terminate a pregnancy often experience negative emotions. On the one hand, the negative emotions may be related to the excitement of the sympathetic nervous system caused by trauma. On the other hand, the negative emotions may also be related to the patients themselves or their families. Scholars believe that attention should be paid to intervening in the negative emotions of women undergoing caesarean section in order to reduce the impact of the negative emotions on the efficacy of surgery and the recovery after the surgery [14-16].

HDTS is an emerging nursing intervention and a clinical teaching mode [17]. Studies found that compared with the traditional teaching mode, humanoid diagram teaching can improve the efficiency of rounds and promote personalized nursing, on the one hand. The critical thinking skills of the nursing staff were exercised, and their medical humanistic spirit was cultivated [18-20]. It was found that HDTS sig-

nificantly improved the nursing skills of the trainee nurses and reduced the incidence of adverse events during the nursing process [21].

This study investigated the effect of HDTS on the perioperative complication rate, the postoperative pain, the adverse emotions, and the nursing satisfaction levels of women undergoing caesarean section by setting up different subgroups. The results showed that the women in the SG who underwent HDTS had significantly lower complication rates compared to the women in the CNG who underwent routine nursing care, suggesting that HDTS can improve patient outcomes. A survey of 82 parturient women showed that compared with the CNG who underwent routine care, the complication rate of the SG undergoing HDTS was 2.44%, which was significantly lower than the rate in the CNG (9.76%). HDTS is more intuitive than traditional nursing interventions, and the main points of postoperative nursing for the parturient are clarified through drawing, which is convenient for the nursing staff to carry out predictive intervention, so the incidence of postoperative complications is lower [22]. We believe that HDTS illustrates the care needs of patients through drawing. The visual display of key nursing points avoids inconsistency in the levels of care caused by differences in clinical experience. HDTS also highlights the care needs of patients and develops personalized care plans according to each patient's condition, thus significantly improving the nursing efficiency [23].

The results of this study also show that the patients in the SG had significantly lower postoperative pain, anxiety and depression than the patients in the CNG, suggesting that HDTS improved the patients' postoperative pain and negative moods. A retrospective analysis of women who underwent cesarean section found that HDTS increased the rate of good

pain management from 80.49% to 97.56% and reduced the number of grade III pain incidences from 5 to 0. The authors concluded that HDTS treated postoperative pain management as one key point of care and encouraged caregivers to communicate with the patients about the effects of the pain interventions, thus significantly reducing the pain levels in women [24]. In this study, we believe that the postoperative pain levels in women undergoing caesarean section are, on the one hand, related to the quality of the operation, and on the other hand, they may also be related to the psychological trauma caused by surgery [25]. Routine nursing interventions only provide analgesia, without implementing psychological interventions. In this study, the psychological care is also one of the key points, and the patients' negative emotions were alleviated through positive encouragement or family support, thus reducing their pain levels. The results showed that the patient satisfaction rate in the SG reached 97.67%, which was significantly higher than the 83.78% rate in the CNG. Some studies point out that HDTS is based on the people-oriented concept. Personalized nursing measures were formulated in a targeted manner centering on the needs of patients. Compared with routine nursing, it strengthens the communication between nurses and patients and helps build a harmonious doctor-patient relationship [26, 27].

In summary, HDTS can reduce the complication rate of patients after caesarean section, improve patients' postoperative pain and adverse moods, and improve patients' satisfaction levels with the nursing interventions, so it is of positive significance to a harmonious doctor-patient relationship. The innovation of this study was its detailed analysis of the effect of HDTS on women undergoing caesarean section from the aspect of their complications, pain, adverse emotions and nursing satisfaction, and the data are detailed and reliable, so the study can provide information for carrying out subsequent studies. The shortcoming of this study was that the study cohort was small. In addition, it only included women undergoing caesarean section and did not explore the impact of HDTS on the nursing staff. A targeted study with a large sample size will be carried out as our next step.

Disclosure of conflict of interest

None.

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