Volume 22, No 3 | International Journal of Radiation Research, July 2024

In senile patients with severe disease, the diagnostic effect of enhanced abdominal computerized tomography scan is affected by high quality nursing interventions

X. Chen[1] and HX. Li[2*]

[1]*Department of Radiology, The Second Medical Center of Chinese PLA General Hospital, Beijing 100000, China*
[2]*Department of Critical Care Medicine, The Fifth Medical Center of Chinese PLA General Hospital, Beijing 100000, China*

► ***Short Report***

Corresponding author:
Huanxin Li
E-mail:
Lihuanxin12345@163.com

Received: November 2023
Final revised: December 2023
Accepted: January 2024

Int. J. Radiat. Res., July 2024; 22(3): 757-761

DOI: 10.61186/ijrr.22.3.757

Keywords: *high quality nursing, CT scan, senile, diagnosis.*

ABSTRACT

Background: To measure the impact of high quality nursing intervention on the diagnostic effect of enhanced abdominal computerized tomography (CT) scan in senile patients with severe disease. ***Materials and Methods:*** One hundred and two senile patients with severe disease who had an enhanced abdomen CT scan at hospital between January 2020 and December 2022 were selected and divided into two groups: the experimental group (EG) and the control group (CG). Patients in the EG adopted high-quality nursing interventions based on the routine nursing that the CG had adopted. The scan success rate, negative emotions, degree of pain, incidence of adverse reactions and nursing satisfaction in both groups were compared. ***Results:*** The scan success rate of the EG presented higher when comparing with the CG ($P < 0.05$). The self-rating Anxiety Scale (SAS), self-rating Depression Scale (SDS) and visual analogue scale (VAS) scores in the EG presented lower when comparing with the CG ($P < 0.05$). When compared to the CG, the EG showed a lower incidence of adverse effects ($P < 0.05$). The nursing satisfaction rate of the EG presented higher when comparing with the CG ($P < 0.05$). ***Conclusion:*** High quality nursing intervention can not only promote the success rate of examination and image quality, but also reduce bad emotions of patients and improve satisfaction when the elderly patients with severe CT scan are undergoing enhanced abdominal CT scan, which is valuable for promotion and application.

INTRODUCTION

Enhanced abdominal CT scanning, as the name suggests, is a scanning method used to enhance the effect of abdominal examination in patients [1]. Compared with traditional scanning methods, abdominal CT enhanced scanning has a higher examination accuracy, so it has been widely used in clinical practice [2]. When performing abdominal CT enhancement scan, patients need to be injected with contrast agent to carry out CT scan [3]. Contrast agent can distinguish patients' normal tissues from diseased tissues, so that the results after examination can be displayed more accurately, which is of great help to the degree of lesions and diagnosis of the disease [4]. However, the use of abdominal CT enhanced scan is flawed, and the contrast agent used may cause discomfort and aversion of patients, resulting in discomfort in the examination, and easy to cause patients to not cooperate in the scan, resulting in insufficient image clarity [5]. The clarity of the image directly affects the subsequent diagnosis of the condition, so it is essential to ensure the clarity of the image, and the clarity of the image requires the close cooperation of the patient.

Senile patients with severe disease tend to be less responsive and understanding than younger patients as their bodies age [6]. Therefore, when performing abdominal CT scan on elderly patients, corresponding nursing work should be carried out to improve the cooperation of elderly patients with scanning and avoid ineffective scanning.

Patient-centered care, bolstering the foundation of nursing, putting the nursing responsibility system into full practice, enhancing the professional meaning of nursing, and raising the standard of nursing services as a whole are all considered aspects of high-quality nursing [7]. "Patient-centered" means that patients are prioritized in all activities and are considered everywhere in terms of ideology and medical behavior [8]. In addition, high-quality nursing can meet the basic living needs of patients, ensure nursing safety, and maintain physical comfort; at the same time, it help patients to psychological adjustment and maintain balance; moreover, it can obtain the overall coordination and support of the patient's family and social system as well as obtain high satisfaction of patients with the most

[Downloaded from ijrr.com on 2026-09-11]

[DOI: 10.61186/ijrr.22.3.757]

appropriate nursing [7,9]. At present, high-quality care plays an important role in symptom management, quality of life, survival time, and recurrence rates of a variety of diseases. The quality of life for patients with perioperative lung cancer is impacted by superior nursing care [10]; High-quality care for alleviating perioperative depression and anxiety in patients with thyroid cancer [11]; High-quality nursing interventions affect perioperative psychological disorders in patients with gastric cancer [12]. Therefore, exploring the relationship between high-quality nursing interventions and enhanced abdominal CT can improve the diagnostic accuracy of elderly patients and better identify patients' signs, which can help reduce the pressure on patients and hospitals.

In our study, we investigated the influence of high -quality nursing care on the improved abdomen CT scan's diagnostic utility in elderly patients with serious illness.

MATERIALS AND METHODS

General data

One hundred and two senile patients with severe disease who underwent enhanced abdominal CT scan in our hospital from January 2020 to December 2022 were selected and allocated into the control group (CG) and the experimental group (EG), and each group had 51 cases. In the CG, 30 cases were female and 21 cases were male, ranged from 60 to 83 years, with the average age was (72.63 ± 7.68) years. In the EG, 29 cases were female and 22 cases were male, ranging in age from 61 to 83 years, with the average age was (72.6 8± 7.72) years. No statistical significance could be discovered in the general data between 2 groups (P > 0.05), reflecting comparable. Inclusion criteria: (1) Patients aged over 60 years received enhanced abdominal CT diagnosis; (2) Informed the patient of the significance of the study, with the consent of the patient; (3) Normal psychological and mental aspects. Exclusion criteria: (1) Patients had malignant tumors; (2) Patients had organ disease or failure; (3) Audio-visual impairment; (4) Patients with allergic constitution.

Methods

The CG adopted routine nursing. Before examination, the CG was reminded to come to the hospital on an empty stomach and take 1.5%~2% contrast agent 300~500 mL orally before hepatobiliary scan. Pancreatic scan subjects were fasting for 4~6 h, and oral administration of 1% ~1.5% contrast medium 500~700 mL 30 min before examination. Nursing staff should pay attention to ask the patient about drugs, food allergies, contrast media contraindications, etc. The instruments we use was 256-MDCT (Revolution CT, GE Healthcare, USA). Nursing staff should remind the patient not to cough, sneeze or hiccup during the examination, and do not move the body.

Patients in the EG received high-quality nursing intervention based on the CG, and the method was as follows: (1) Before the scan, health education was carried out to teach elderly patients and their families the precautions of abdominal CT enhanced scan and some knowledge on diet, so as to improve their self-confidence as well as nursing compliance. Nursing staff should also carry out psychological intervention on patients to improve the depressed mood of the patient because of the disease, and inform the relaxed and cheerful mood is more conducive to the rehabilitation of the disease. (2) During the scan, the patient should be instructed to hold his breath and exhale slowly to improve the clarity of the patient's scan. Venipuncture should be performed on the patient's blood vessels that are better for intravenous injection, and 5 mL contrast agent should be injected first to observe whether the patient has any abnormalities. If no abnormalities are found, enhanced CT scan could be started. Before the scan, first aid measures should be taken for the pathological reaction of the patient, and the patient's condition should be observed and questioned at all times during the scan. (3) After the end of the scan, the nursing staff should carry out necessary examinations to check whether the vital signs of the patient were abnormal, whether there were adverse reactions such as vomiting and dizziness, and informed the patient to ensure adequate drinking water to promote the discharge of the angiographic drugs, and within 30 minutes after the end of the examination, the special nursing staff should observe the patient's situation, and notify the doctor immediately if the patient became unwell.

Observation indicators

(1) Scan success rate: Two radiologists analyzed the CT enhanced scan images. If the patient's lesions showed better, the resolution of different tissues was high, and there was no artifact, it was judged to be clear. If the lesion image was fuzzy and unclear, and there were artifacts, it was judged to be unclear. Success rate = Number of clear cases/total cases × 100%.

(2) The patients were asked to use SAS and SDS for self-rating. SAS score < 60 was mild anxiety. SAS score between 60 and 69 indicated moderate anxiety. SAS score > 70 was severe anxiety. SDS score between 53 and 62 indicated mild depression. SDS score in the 63 - 72 range were moderately depressed. SDS score > 72 was classified as major depression.

(3) The pain VAS score of patients was compared. The VAS score was full of 10 points and 1-3 points were classified as mild pain. 4 to 6 are classified as severe pain; 7 to 10 is severe pain.

(4) The incidence of adverse reactions including

[Downloaded from ijrr.com on 2026-09-11]

[DOI: 10.61186/ijrr.22.3.757]

headache, dizziness, as well as nausea and vomiting was compared.

(5) Patients filled in the nursing satisfaction questionnaire, the full score was 100, < 60 was dissatisfied; 60 ~ 90 was basically satisfied; > 90 score is very satisfactory. Nursing satisfaction rate = (number of very satisfied cases + number of basic satisfied cases)/total number of cases in this group × 100.0%.

Statistical analysis

SPSS 20.0 statistical software was utilized for processing the relevant data of this patient. To compare the groups, the T - test was used and the measurement results were reported as (x ± s). The frequency and percentage (%) of the statistical data were presented, and the $\chi 2$ test was used to compare the groups. Statistics were deemed significant if $P < 0.05$.

RESULTS

Scan success rate in both groups

Table 1 revealed that the success rate of CT scan results in control group was 78.43%, and the success rate in experimental group was 94.12%. Statistical analysis showed that the scan success rate in the EG presented higher when comparing with the CG ($P < 0.05$).

Table 1. Scan success rate in Control group and Experimental group.

Groups	Cases	Clear	Unclear	Success rate
Control group	51	40	11	40 (78.43%)
Experimental group	51	48	3	48 (94.12%)
χ^2				5.30
P				<0.05

SAS and SDS scores in both groups

We scored the SAS and SDS for control group and experimental group separately. The findings demonstrated that, when compared to the CG, the SAS and SDS scores in the EG were substantially reduced ($P < 0.05$) (figure 1).

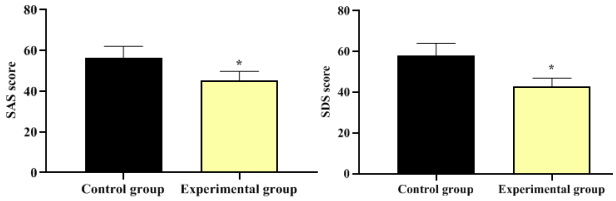

Figure 1. SAS and SDS scores in Control group and Experimental group. *P < 0.05.

VAS score in both groups

The VAS score was full of 10 points, and 1 - 3 points were classified as mild pain. 4 to 6 are classified as severe pain; 7 to 10 is severe pain. We assessed the VAS score for control group and experimental group separately. Figure 2 revealed the VAS score in the EG presented lower when comparing with the CG ($P < 0.05$).

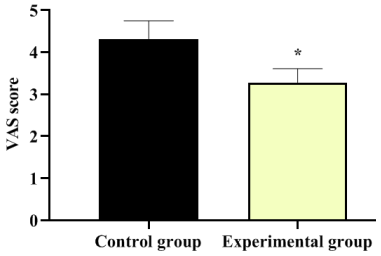

Figure 2. VAS score in Control group and Experimental group. *P < 0.05.

Incidence of adverse reactions in both groups

To find out whether high-quality care improved patients' physical condition during or after enhanced abdominal CT scans, we performed statistical analyses of adverse effects (including headache, Dizziness, nausea and vomiting) that patients experienced. According to table 2, there were fewer adverse reactions in the EG than in the CG ($P < 0.05$).

Table 2. Incidence of adverse reactions in Control group and Experimental group.

Groups	Cases	Headache	Dizziness	Nausea and vomiting	Total incidence rate (%)
Control group	51	3	4	3	10 (19.61%)
Experimental group	51	1	0	1	2 (3.92%)
χ^2					6.04
P					<0.05

Nursing satisfaction in both groups

We investigated the nursing satisfaction of the control group and experimental group of patients separately. Table 3 indicated that the nursing satisfaction rate in the EG presented higher when comparing with the CG ($P < 0.05$).

Table 3. Nursing satisfaction in Control group and Experimental group.

Groups	Cases	Very satisfied	Basically satisfied	Dissatisfied	Total satisfaction rate
Control group	51	22	17	12	39 (76.47%)
Experimental group	51	30	18	3	48 (94.12%)
χ^2					6.33
P					<0.05

DISCUSSION

Abdominal CT enhanced scan has the advantages of high lesion detection rate and high qualitative accuracy [13]. During the scanning process, the use of high-pressure syringes to inject large doses of contrast agents can significantly improve the contrast between normal and diseased tissues, and the structure and scope of lesions can be displayed more clearly, which is convenient for clinical access to more effective information and definitive diagnosis

[Downloaded from ijrr.com on 2026-09-11]

[DOI: 10.61186/ijrr.22.3.757]

[14]. However, the injection dose and speed of contrast agents often cause adverse reactions to patients. In order to avoid side effects, it is necessary to make careful preparations before CT enhancement scan to improve patient cooperation [15]. At the same time, numerous clinical studies and practices have validated that the accuracy of CT enhanced scan results directly depends on the quality of the image, but the quality of the image is not only closely related to the scanning technology itself, but also greatly affected by the stability of the patient's psychological state, cognition of the examination, including emotion and other factors [16]. Therefore, nursing intervention is particularly critical.

High quality nursing is a novel nursing model, which mainly gives the best nursing measures according to the patient's condition in clinical practice, so as to promote the improvement of nursing level and improve the treatment effect [17]. According to Dong *et al*., a successful nurse intervention can improve patient participation during an abdominal MR examination and enhance image quality [18]. Consistent with our finding, the results of our study indicated that the scan success rate in the EG presented higher relative to the CG, which suggested that the application of high quality nursing could promote the scan success rate of senile patients with severe disease.

Besides, our study indicated that the SAS, SDS and VAS scores in the EG presented lower when comparing with the CG, which indicated that high quality nursing could relieve the bad emotions and degree of pain in senile patients with severe disease underwent enhanced abdominal CT scan. Consistently, it has been reported that high-quality nursing intervention based on humanistic care can effectively relieve negative emotions of acute leukemia patients undergoing chemotherapy [19]. Besides, high quality nursing on the basis of childlike interest has beneficial outcomes in reducing the degree of pain of children with cleft lip and palate [20].

Moreover, According to Fang *et al*., high-quality treatment can lower the frequency of adverse reactions, promote the nursing satisfaction and patients compliance, and having a good prognosis in glioma patients undergoing radiotherapy and chemotherapy [21]. Likewise, our study displayed that the incidence of adverse responses in the EG was less than in the CG, and the nursing satisfaction rating in the EG was better than in the CG, which suggested that high quality nursing could lessen the incidence of adverse responses and promote the nursing satisfaction of senile patients with severe disease underwent enhanced abdominal CT scan.

CONCLUSION

high quality nursing intervention can not only promote the success rate of examination and image quality, but also reduce the bad emotions of patients and improve satisfaction when the elderly patients with severe CT scan are undergoing enhanced abdominal CT scan, which is worthy of promotion and application.

ACKNOWLEDGMENT

None.

Funding: None.

Conflicts of interests: No potential conflict of interest was reported by the authors.

Ethical consideration: All patients signed a documented, voluntarily informed consent form. All methods were carried out in compliance with the Helsinki Declaration criteria, and this study was authorized by our institution's Ethics Committee (2020KLR213).

Author contribution: Huanxin Li conceived and designed the experiments. Xin Chen contributed significantly to the experiments and arranging data. Huanxin Li and Xin Chen performed data analyses. Huanxin Li wrote the draft manuscript. Huanxin Li and Xin Chen revised the manuscript. All authors read and approved the final manuscript.

REFERENCES

1. Cohen IL, Guranda, A Ironi, L Naveh, and N Tau, *2022.* The use of contrast enhanced thoraco-abdominal CT in patients with non-traumatic undifferentiated hemodynamic shock. *Eur J Radiol,* ***151:*** *p. 110290.*
2. Higashigaito K, A Euler, M. Eberhard, TG Flohr, B Schmidt and H Alkadhi, *2022.* Contrast-Enhanced Abdominal CT with Clinical Photon-Counting Detector CT: Assessment of Image Quality and Comparison with Energy-Integrating Detector CT. *Acad Radiol,* ***29 (5):*** *p. 689-697.*
3. Cansu A, D Atasoy, I Eyüboğlu and M Karkucak, *2020.* Diagnostic efficacy of routine contrast-enhanced abdominal CT for the assessment of osteoporosis in the Turkish population. *Turk J Med Sci,* ***50(1):*** *p. 110-116.*
4. Wiedbrauck D, M Karczewski, SO Schoenberg, C Fink and H Kayed, *2023.* Influence of contrast agent on artificial intelligence-based CT low attenuation volume percentage measurement. *Acta Radiol,* ***64(6):*** *p. 2111-2117.*
5. McDonald JS, *2022.* Contrast Agent Substitution to Prevent Repeat Adverse Reactions. *Radiology,* ***305(2):*** *p. 350-352.*
6. Xiang Y, H Jiang, L Zhao, Q Liu and H Lin, *2022.* Delays in Seeking Medical Services in Elderly Patients With Senile Cataract. *Front Psychol,* ***13:*** *p. 930726.*
7. Gunther M and MR Alligood, *2002.* A discipline-specific determination of high quality nursing care. *J Adv Nurs,* ***38(4):*** *p. 353-9.*
8. Ortiz MR, *2018.* Patient-Centered Care: Nursing Knowledge and Policy. *Nurs Sci Q,* ***31(3):*** *p. 291-295.*
9. Wang M, Y Sun, M Zhang, R Yu and J Fu, *2022.* Effects of high-quality nursing care on quality of life, survival, and recurrence in patients with advanced nonsmall cell lung cancer. *Medicine (Baltimore),* ***101(37):*** *p. e30569.*
10. Yu X and J Liu, *2019.* Effects of high-quality nursing care for patients with lung cancer during the perioperative period: A protocol of systematic review of randomized controlled trials. *Medicine (Baltimore),* ***98(48):*** *p. e18132.*
11. Cui Y and YX Li, *2020.* Effect of high-quality nursing on alleviating depression and anxiety in patients with thyroid cancer during perioperative period: A protocol for systematic review. *Medicine (Baltimore),* ***99(45):*** *p. e23018.*
12. He XL and ZM Cao, *2020.* Effect of high-quality nursing intervention on the psychological disorder in patients with gastric cancer during perioperative period: A protocol of systematic review and meta-analysis. *Medicine (Baltimore),* ***99(23):*** *p. e20381.*

[Downloaded from ijrr.com on 2026-09-11]

[DOI: 10.61186/ijrr.22.3.757]

13. Yu C, CP Anakwenze, Y Zhao, RM Martin, EB Ludmir, SN J, *et al*., *2022*. Multi-organ segmentation of abdominal structures from non-contrast and contrast enhanced CT images. *Sci Rep,* ***12(1):*** *p. 19093.*
14. Summers RM, DC Elton, S Lee, Y Zhu, J Liu, M Bagheri, *et al*., *2021.* Atherosclerotic Plaque Burden on Abdominal CT: Automated Assessment With Deep Learning on Noncontrast and Contrast-enhanced Scans. *Acad Radiol,* ***28(11):*** *p. 1491-1499.*
15. Hagen F, J Hofmann, R Wrazidlo, R Gutjahr, B Schmidt, S Faby, *et al*., *2022.* Image quality and dose exposure of contrast-enhanced abdominal CT on a 1st generation clinical dual-source photon-counting detector CT in obese patients vs. a 2nd generation dual-source dual energy integrating detector CT. *Eur J Radiol,* ***151:*** *p. 110325.*
16. Gullberg LM, LG Murkes, JA Lindholm and B Frenckner, *2021.* Optimizing Contrast-Enhanced Thoracoabdominal CT in Patients During Extracorporeal Membrane Oxygenation. *Acad Radiol,* ***28 (1):*** *p. 58-67.*
17. Fu SL, CH Sun, XX Shang and XS Liu, *2019.* High quality nursing of children with pneumonia complicated with heart failure. *J Biol Regul Homeost Agents,* ***33(3):*** *p. 905-910.*
18. Dong GQ, WW Wang, K Deng and GL Wang, *2016.* The pilot study of radiology nursing intervention in abdominal 3-T Magnetic Resonance examination. *Rev Esc Enferm USP,* ***50(6):*** *p. 961-964.*
19. Wang Z, *2022.* Application of High-Quality Nursing Intervention Based on Humanistic Care Combined with the Project Teaching Method in Patients with Acute Leukemia Undergoing Chemotherapy. *J Healthc Eng,* ***2022:*** *p. 2972037.*
20. Peng Y, X Hao, Y Guo, X Zhang, Y Li, Y Ma, *et al*., *2021.* High quality nursing based on childlike interest in children with cleft lip and palate: application assessment after operation. *BMC Oral Health,* ***21(1):*** *p. 602.*
21. Fang H, S Hu, S Liang and G Yao, *2022.* The Clinical Value of High-Quality Nursing in Concurrent Radiotherapy and Chemotherapy after Glioma Surgery and Its Influence on the Stress Indicators Cor, ACTH, and CRP. *J Healthc Eng,* ***2022:*** *p. 8335400.*

[Downloaded from ijrr.com on 2026-09-11]

[DOI: 10.61186/ijrr.22.3.757]

[DOI: 10.61186/ijrr.22.3.757] [Downloaded from ijrr.com on 2026-09-11]