Impact of comprehensive, high-quality peri-operative nursing care on patients undergoing painless gastrointestinal endoscopy's psychological state, vital signs, and anesthetic medication: A systematic study and meta-analysis

B.Kalpanadevi [1],E.Samantha [2],P.Chandrashekar [3],Kasarapu Priya Nandini [4,]

Abstract

The goal of this study is to determine how perioperative whole-quality nursing care affects patients having painless gastrointestinal endoscopy in terms of their psychological state, vital signs, and anesthetic medication. It also serves as a guide for lowering risks and enhancing painless GI endoscopy safety.
Methods: Cochrane Library, Web of Science, Embase, Pubmed, and other databases were retrieved. Based on predetermined criteria, literature was chosen, and quality assessments were carried out to retrieve the necessary data. In the end, 13 publications were included in the meta-analysis of pertinent data.
Results: Patients receiving high-quality perioperative nursing care showed significant improvements in self-reported anxiety and depression levels, as well as in vital signs indicators like systolic and diastolic blood pressure, mean arterial pressure, and heart rate. They also experienced a decrease in the dosage of narcotic drugs. This was based on a meta-analysis of 13 relevant randomized controlled trials (RCTs). Both the diagnosis and treatment times were considerably shortened (p < 0.05). Furthermore, there was a decrease in the occurrence of respiratory depression (p < 0.00001).
In summary, our meta-analysis indicates that providing patients with painless gastrointestinal endoscopies with perioperative high-quality nursing care might decrease psychological stress, minimize the need for anesthetic, and expedite the endoscopic process.
Keywords: Anesthesia, painless gastrointestinal endoscopy, perioperative whole-quality nursing, Systematic review and meta-analysis

INTRODUCTION

Digestive endoscopy is a major method used to diagnose digestive tract diseases in recent years [1,2]. Because, painless gastroscopy combined with enteroscopy has a painless feeling, only one anesthetic is needed for two kinds of examinations. Pathological conditions of stomach and colon are obtained once through gastroscopy, which reduces pain and other discomfort of examinees [3,4]. Painless gastroscopy has gradually played a significant role in clinical practice. However, because most examinees do not understand basic knowledge and precautions about painless gastroscopy, (which is an invasive examination method), it leads to psychological stress reaction, restlessness, anxiety, and even fear [5]. It also promotes physical stress reaction of examinee. Two

kinds of stress reactions affect and interact with each other, which aggravates their compound stress reaction. At the same time, negative emotions such as anxiety seriously affect examination and recovery [6,7]. Painless gastroscopy takes a long time to operate and is needed to inject more anesthetic drugs, resulting in a high incidence of respiratory depression in patients [8].

During perioperative period, high-quality nursing should be implemented, and basic situation of the patient before examination should be understood, key points for attention explained, one-to-one psychological counseling be conducted, and a friendly nurse-patient relationship should be established, which lays a firm

Assistant professor [1,2,3,4],
Department of Pharmacy,
Samskruti College of Pharmacy,
Kondapur (V), Ghatkesar (M) Medchal Dist, Telangana, India.

foundation for smooth examination. During examination, strengthening observation of vital signs, psychological conditions, and changes in consciousness, while actively communicating with patients significantly improves sense of security, and eases their tension, doubts, and other negative emotions. It is important to prevent and reduce adverse events by allowing patients to leave after confirming their vital signs, and recovered consciousness [9-13].

Therefore, the impact of peri-operative quality of nursing care on psychological status, vital signs and anesthetic medication of patients undergoing painless gastrointestinal endoscopy was investigated in order to provide reference for reducing adverse risks and improving safety of painless gastrointestinal endoscopy.

METHODS

Inclusion criteria

Case-control studies or cohort studies, English literature related to psychological state, vital signs, and impact of anesthetic drugs in painless gastroscopy patients in various databases, patients who received high-quality nursing treatment throughout the peri-operative period (referred to as study group), patients who received routine nursing treatment (referred to as control group). There was no significant difference in general information between study and control groups.

Exclusion criteria

Conference papers, meta-analyses, case studies, reviews, repeated publications, animal experiments, thesis, etc., unclear research indicators or lack of raw data, and uncontrolled retrospective study.

Search strategy

All literature published from January 31, 2010 to April 30, 2023 in databases such as Pubmed, Embase, Cochrane Library, and Web of Science were retrieved. The search strategy and keywords were as follows: ("high quality of nursing care" or "nursing care"); ("painless gastrointestinal endoscopy" or "Gastrointestinal endoscopy"), and ("anesthetic" or "vital signs") (Figure 1).

Data extraction and quality assessment

Data extraction was conducted on 13 included studies, including; basic information (first author, region, publication year, and research design type), and clinical observation indicators (various research indicators and number of cases) (Figure 2).
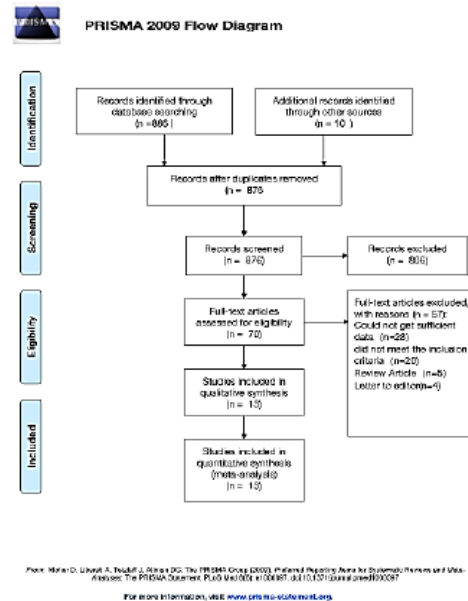
**Figure 1:** Flow diagram of literature search procedure
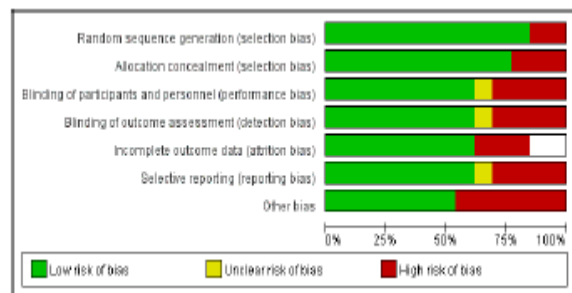
RESULTS

Flow chart of study selection

As of April 30, 2023, a total of 896 articles were retrieved from databases and imported into Endnote X9 software. A total of 806 duplicate articles were screened out. After reading title and abstract, 70 pieces of literature that did not match the content were screened out. Finally, a total of 13 [14-26] were included for meta-analysis (Table 1).
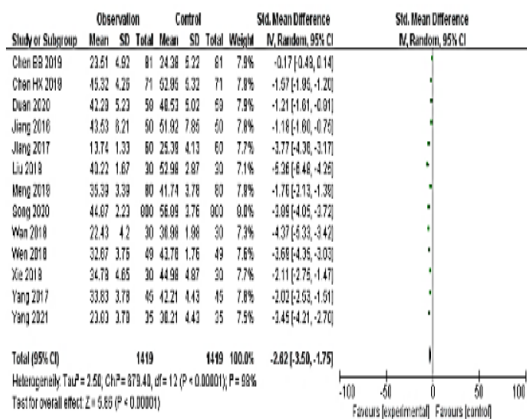
Pooled analysis

Meta-analysis of data from thirteen eligible studies [14-26] showed that levels of Self Rating Anxiety Scale (SAS) were significantly improved in patients with peri-operative high-quality nursing care (random effect model, SMD = -2.62 95 % CI= -3.5, - 1.75 (Figure 3). Furthermore, Self-Rating Depression Scale (SDS) levels were also significantly improved in patients with peri-operative high-quality nursing care (random effect model, SMD = -13.87, 95 % CI = -16.54, - 11.2 (Figure 4). This indicated that peri-operative whole high-quality nursing care ameliorated the psychological status of patients undergoing painless gastrointestinal endoscopy.
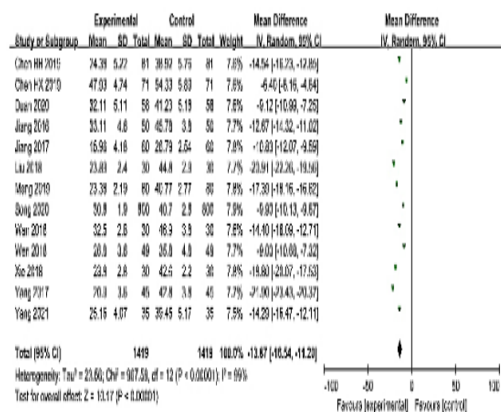
Furthermore, meta-analysis of data from thirteen eligible studies [14-26] also showed that dose of narcotic drugs was significantly decreased in patients with peri-operative whole high-quality nursing care (random effect model, SMD = -10.98, 95 % CI = -12.74, - 9.22 (Figure 6). In terms of diagnosis and treatment time, meta-analysis showed that patients with peri-operative whole high-quality nursing care significantly decreased diagnosis and treatment time (random effect model, SMD = -9.16, 95 % CI = -13.04, -5.29) (Figure 7). Also, meta-analysis of data from thirteen eligible studies [14-26] showed that the incidence of respiratory depression was significantly decreased in patients with peri-operative whole high-quality nursing care (random effect model, SMD = 0.19, 95 % CI = 0.1, 0.37 (Figure 8).
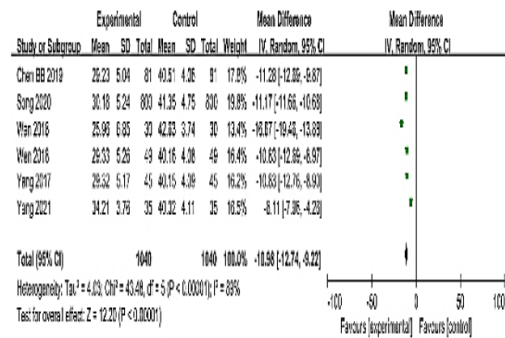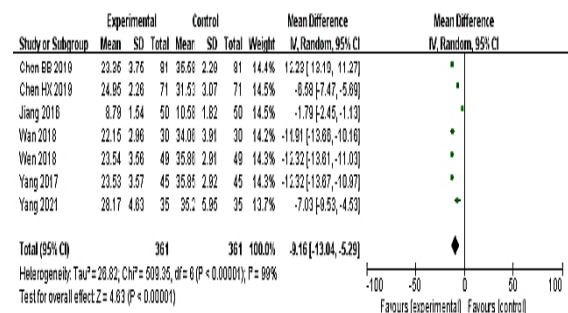

Figure 6: Meta-analysis of dose of narcotic drugs in study group compared to control group

Figure 7: Meta-analysis of diagnosis and treatment time in study group compared to control group

Figure 8: Meta-analysis of the incidence of respiratory depression in study group compared to control group

Sensitivity analysis and publication bias

Sensitivity analysis revealed that after excluding various studies, merged results did not change, indicating that research results are relatively stable. On the other hand, the funnel plot of this study shows a symmetrical distribution, indicating no publication bias (Figure 9).
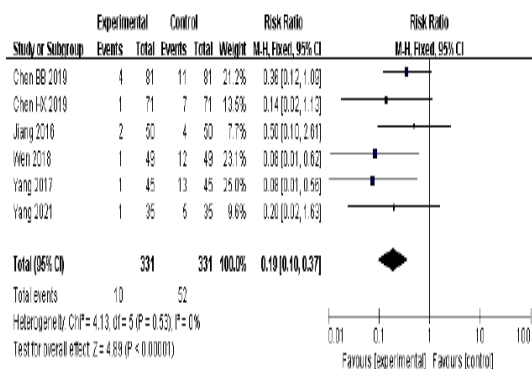

Figure 3: Meta-analysis on SAS in study group compared to control group

Figure 4: Meta-analysis of SDS in study group compared to control group
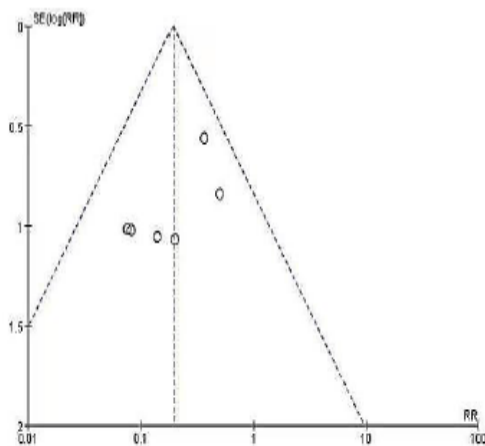
Figure 9: Funnel plot of data in the analysis of SAS

DISCUSSION

Gastrointestinal diseases are a common kind of diseases in clinics. With increased work pressure and changes in eating habits, the incidence rate of gastrointestinal diseases is increasing yearly [27]. Gastrointestinal endoscopy is often used in clinical diagnosis of gastrointestinal diseases, mainly to examine the condition of patients' gastrointestinal tract through gastrointestinal endoscopy for early diagnosis and timely intervention [28]. Traditional gastroenteroscopy is associated with a certain degree of pain. In addition, examination takes a long time, and some patients have resistance to gastroenteroscopy. Emergence of electronic painless gastroenteroscopy has therefore effectively reduced the pain of gastroenteroscopy, mainly by using anesthetic drugs to enable patients to be examined when they are asleep. Examination time is short, and there is no pain [29]. However, in process of electronic painless gastroenteroscopy, there are also some nursing risk factors. For example, patients refused to accept painless gastroscopy because they did not know about electronic painless gastroscopy before examination and were worried about the effects of anesthetic drugs on their bodies [30,31]. Therefore, reasonable nursing interventions should be implemented for patients when conducting electronic painless gastroscopy. High-quality nursing takes patients as the center of nursing services, enhancing service quality level of overall nursing while intervening in basic nursing measures, penetrating systematic and high-quality nursing services in different stages before, during and after diagnosis and treatment [32]. Previous studies have confirmed that high-quality nursing significantly improved negative psychological emotions of patients undergoing surgery and reduced stress reactions [33]. High-quality nursing adopted in this study was aimed at patients undergoing painless

gastrointestinal endoscopy diagnosis and treatment. Before diagnosis and treatment, psychological, and emotional conditions, and problems of patients were analyzed in detail, and then a more targeted nursing intervention program was developed, which significantly reduced negative psychological emotions. At the same time, it also significantly enhanced awareness of painless gastrointestinal endoscopy diagnosis and treatment technology, thus improving compliance with diagnosis and treatment. In addition, during painless gastrointestinal endoscopy diagnosis and treatment, implementation of high-quality nursing intervention guided patients in choosing the appropriate posture and position, so that diagnosis and treatment effect is significant. After diagnosis and treatment, implementation of high-quality nursing helps to correctly address various nursing problems, such as avoiding overheated or excellent food, which significantly reduces the severity of damage to gastrointestinal mucosa [34,35].

Results of meta-analysis showed that SAS and SDS scores of patients in study group after nursing intervention were significantly lower than control group before and after nursing intervention. High-quality nursing significantly reduces negative psychological emotions with painless gastrointestinal endoscopy, such as anxiety and depression. Obvious improvement in negative psychological emotions also reduced stress reactions during diagnosis and treatment. Furthermore, results also revealed that SBP, DBP, MAP, heart rate and other vital signs in study group during diagnosis and treatment were significantly lower than control group, suggesting that high-quality nursing significantly inhibited stress response. Diagnosis and treatment operation also directly reflected a significant improvement in psychological emotion and stress reaction state. The study found that total amount of anesthetic drugs and incidence of respiratory depression in study group were significantly lower than control group. Also, the diagnosis and treatment duration of painless gastroscopy were significantly shorter in study group compared to control group. This suggests that high-quality nursing reduces trauma caused by painless gastroscopy and accelerates recovery speed after surgery. With longer painless gastrointestinal endoscopy, more anesthetic drugs will be needed in total, and risk of respiratory depression in patients will increase significantly [36]. High-quality nursing significantly reduced incidence of respiratory depression and improved the safety and reliability of diagnosis and treatment operations. In addition, close monitoring of relevant indicators of vital signs after diagnosis and treatment is needed, so as to effectively prevent and reduce incidence of various adverse reactions. It has been reported that most elderly patients are accompanied

by chronic diseases such as hypertension, coronary heart disease and diabetes. These diseases accompanied by intravenous use of protocol and other drugs, easily result in complications such as decreased blood pressure, slow heart rate, respiratory depression, increased risk of diagnosis and treatment operations, and endanger life safety of patients [37].

CONCLUSION

Preoperative high-quality nursing intervention, through intra-operative nursing, reduces occurrence of respiratory depression, cough and other complications, as well as fluctuation in vital signs. It also encourages patients to go through hitch-less examination and treatment. The success rate of gastroenteroscopy significantly improves, and patients' safety is enhanced through post-operative nursing, including safety protection, disease observation, health guidance and other measures.

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