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Meta-Analysis of the Effect of Continuous Care on Patients with Type 2 Diabetes

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Abstract

A meta-analysis was conducted to assess the effect of continuing care in patients with type 2 diabetes mellitus. ***Methods:*** A review of the PUBMED, CNKI, and Wan Fang databases was done, to find ten randomized controlled trials that used continuous care for patients with type 2 diabetes mellitus, and Review Manager 5.4 the Meta analysis was performed. ***Results:*** Meta-analysis showed that continuation of care could improve fasting blood glucose [MD=-2.17, 95% CI (-3.10, -1.23), P<0.00001], 2-hour postprandial blood glucose [MD=-2.58, 95% CI (-3.21, -1.96), P<0.00001], and glycosylated hemoglobin [MD=-1.20, 95%CI (-2.04, -0.36), P=0.005]. ***Conclusion:*** Continuous care is of great significance for the control of blood glucose in patients with type 2 diabetes.

Keywords: meta-Analysis, type 2 diabetes, continuous care

1. Introduction

Diabetes is a chronic disease that is currently prevalent all over the world and has a huge impact on people, especially type 2 diabetes is more serious, more likely to occur in middle-aged and elderly people, and the cure rate is low. Studies have shown (Boockvar & Vladeċk, 2004) that continuity of care refers to the continuation of continuity of care after admission, and current research shows that continuity of care has a significant effect on the treatment of type 2 diabetes. However, there is a lack of evidence-based evidence, so this study hopes to systematically evaluate the effect of continuous care in patients with type 2 diabetes through meta-analysis, to provide readers with reference for studying continuation care for patients with type 2 diabetes.

2. Information and Methodology

2.1 Inclusion and Exclusion Criteria for Literature

Involvement criteria: Reference type randomized controlled trials. Participants met the WHO criteria for type 2 diabetes in 2001；the type of disease is diabetes. Exclusion criteria: an Intervention not available；the type of study is a research paper.

2.2 Sources of Information

The search Chinese database (CNKI) and English database (PubMed and Google Scholar) required search of Chinese literature under title or abstract, and foreign literature search using title or abstract or Mesh glossary. The search period was established to 11 March 2023.

2.3 Literature Search Strategies

#1: T2DM OR Diabetes Mellitus, type2

#2: Continuity of Patient Care OR Discharge Plan OR Continuum of Care OR Transitional Care OR Nurse Follow-up

#3: #1 AND #2

2.4 Statistical Methods

The review manager 5.4 tool was used for heterogeneity testing for data analysis, and if the P>0.1 and I2≤50%, the fixed-effect model was selected. If P≤0.1 or I2>50%, statistical heterogeneity is considered and a random-effects model is used (Borenstein, Hedges, Higgins, & Rothstein, 2010). For continuous variable data, standardized mean difference (SMD) or weighted mean difference (WMD) were used as the effect scale and 95% CI was calculated.

3. Results

3.1 Literature Screening

After searching, a total of 811 articles related to Chinese and English were obtained, and after removing duplicates, the articles were carefully read, the study design was excluded, the intervention time was less than 3 months, the outcome indicators were not met, and the literature on whether the study subjects were type 2 diabetes was not explained, and finally a total of 10 articles were included. The feature table is shown in Table 1, and the literature inclusion process is shown in Figure 1.

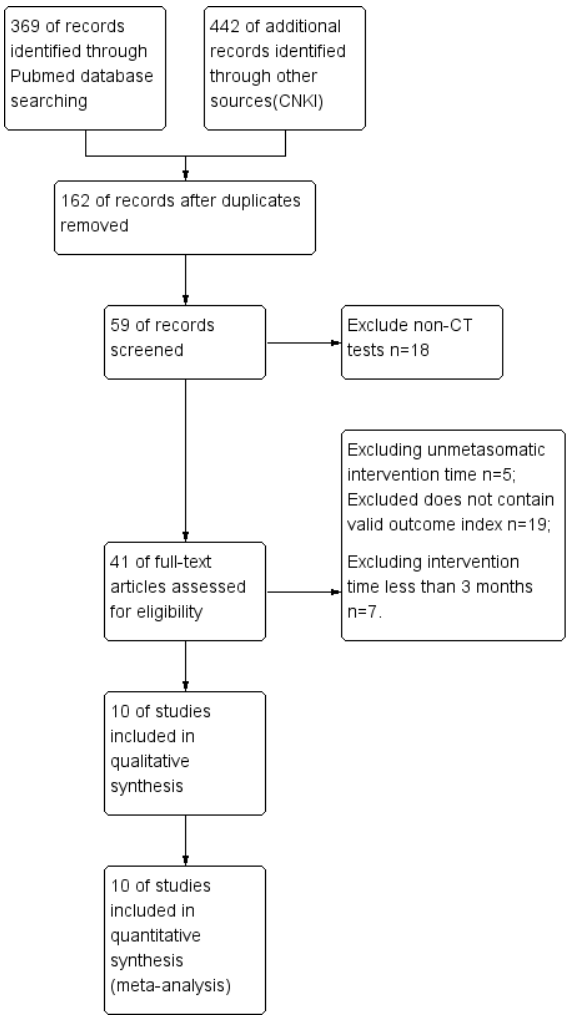

Figure 1.

Table 1. Features of the included literature

Incorporate into Study	Sample Capacity T/C	Age	Intervening Measure T	C	Intervention Time Month	Outcome Indicator
Zhu Ruohong, 2019	30/30	64.47± 9.88	Set up continuing care team, telephone follow-up, home visit, outpatient follow-up.	usual care	12	① ②
Yang Fan, 2019	40/40	67.63± 4.18	Personal file establishment, telephone return visit, patient self-care program implementation.	usual care	12	① ②③
Xia Jingju, 2020	54/54	61.82± 4.57	Dietary intervention; Medication guidance.	usual care	6	① ②③

Wang Jiazhen, 2021	42/34	75. 0 ± 7. 3	Establish a file; Telephone follow-up.	usual care	6	① ②③
Ou Yangqun, 2017	60/60	51.6 ± 7.8	Establish continuing care teams; Developing a continuing care service plan; Set up the return visit system and special register for discharged patients; Diabetes health seminar.	usual care	12	① ③④
Li Ling, 2019	120/120	52.32± 0.21	Comprehensive assessment before discharge; Sports training; Life coaching; Dietary guidance.	usual care	12	① ③
Li Lin, 2018	33/33	66.5	Set up diabetes management team; Admission assessment; Discharge follow-up.	usual care	6	① ②⑤
Guo Tuantuan, 2019	50/50	68.5± 4.4	Establishment of personal files; Telephone follow-up; Patient self-care.	usual care	12	① ③
Cheng Ying, 2018	30/60	46.8± 2.7	Setting up intervention teams; Passive intervention; Maintain a continuing care intervention log.	usual care	12	① ②③⑥
Zhong Fang, 2021	55/55	49.25± 2.14	Set up a continuing care team; Exercise intervention; Dietary intervention; Self-monitoring of medication guidance.	usual care	12	① ②③⑦

Note: T: continuity care group, C: routine care group. ① Fasting blood glucose (FBG) level; ② Glycosylated hemoglobin (HbA1c); ③ 2 h blood sugar after meal (2hPG); ④ Self-management ability; ⑤ Treatment compliance; ⑥ BMI level; ⑦ self-efficacy

3.2 Quality Assessment Results

The quality assessment results of the included literature methodology are shown in Figure 2.

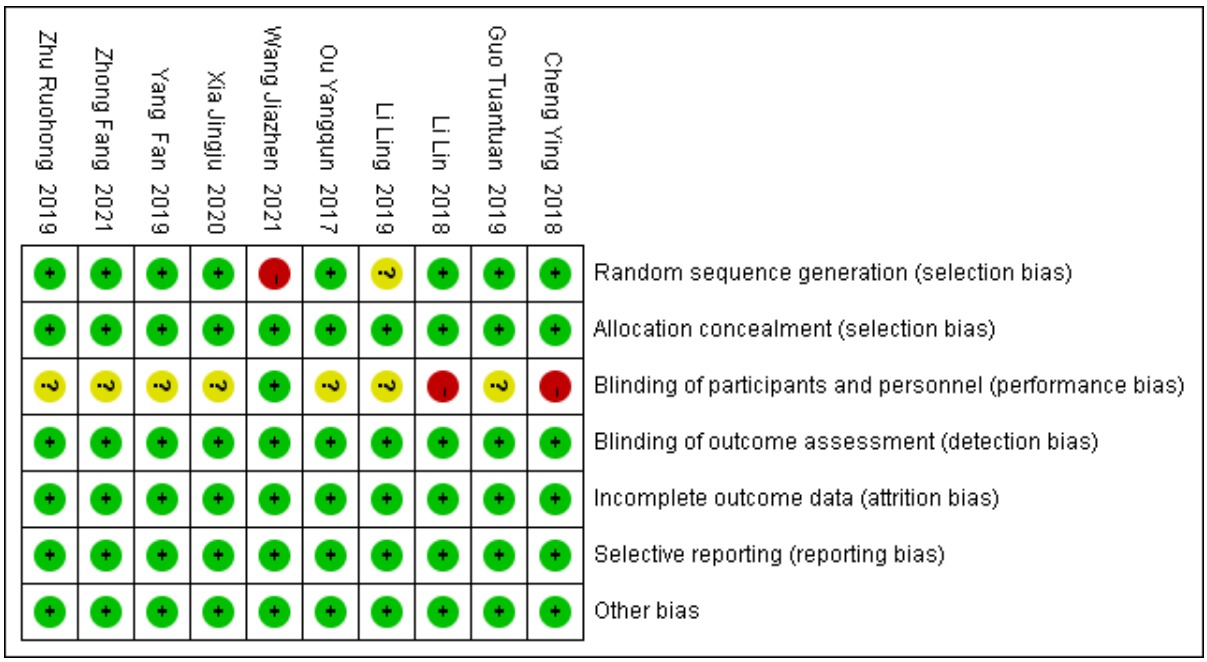

Figure 2.

3.3 Publication Bias Test

Publication bias and sensitivity analysis, publication bias and sensitivity analysis using Review manager 5.4. The reported fasting blood glucose, two-hour postprandial blood glucose, and glycosylated hemoglobin are all less than 0.05, indicating that there is a publication bias. Funnel plots from left to right are fasting blood glucose, two-hour postprandial blood glucose, and glycosylated hemoglobin. See Figure 3.

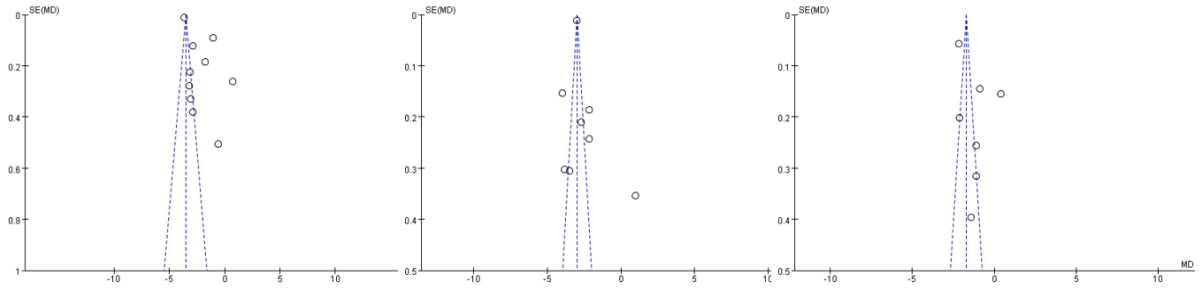

Figure 3.

3.4 Meta-Analysis Results

(1) (Fasting blood glucose) 10 studies compared fasting blood glucose, Heterogeneity test showed that the results were significantly heterogeneous ($p<0.00001$, $I^2=99\%$), so the meta-analysis of the random effect model was adopted, and the sensitivity. According to the analysis, the results before and after using the article-by-article elimination method are more consistent, indicating that the results are more robust. The analysis results show that continuous nursing has statistical significance in controlling fasting blood sugar compared with conventional nursing [MD=-2.17, 95%CI (-3.10, -1.23), P<0.00001], see Figure 4 for specifics.

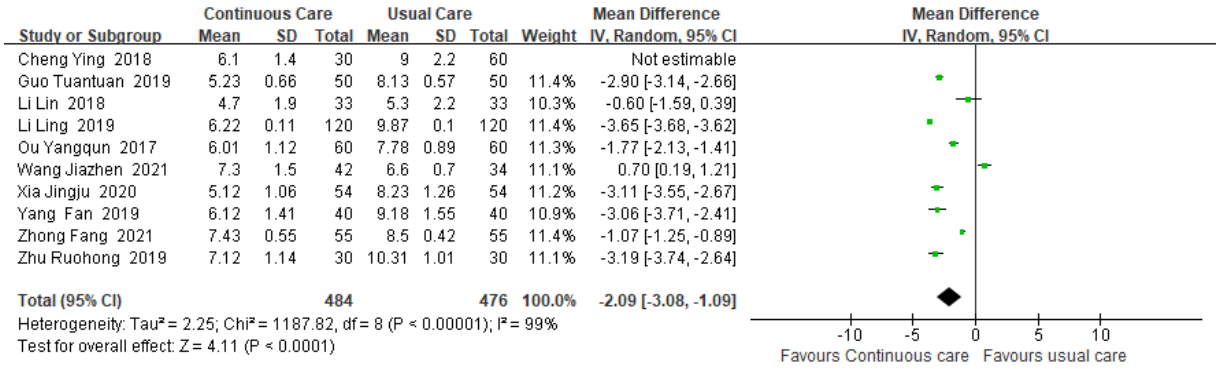

Figure 4.

(2) (postprandial 2-hour blood glucose): comparison of 2-hour postprandial blood glucose in 8 studies. Heterogeneity test showed that the results were significantly heterogeneous ($p<0.00001$, $I^2=97\%$), so the meta-Analysis, after sensitivity analysis, the results before and after using the article-by-article elimination method are more consistent, indicating that the results are more robust. The results of the analysis showed that compared with conventional nursing, continuous nursing had statistical significance in controlling blood sugar 2 hours after meals [MD=-2.58,95%CI(-3.21,-1.96),P<0.00001], see Figure 5 for specifics.

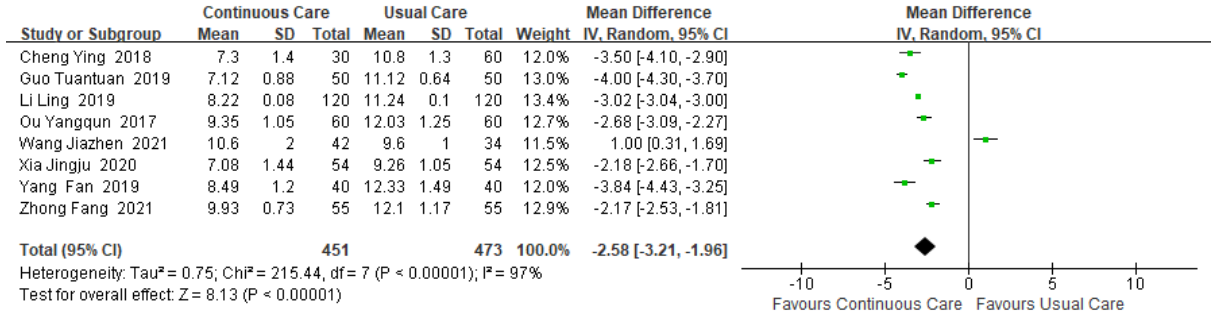

Figure 5.

(3) (Glycosylated hemoglobin) 7 studies compared glycated hemoglobin, and the heterogeneity test showed that the results were significantly heterogeneous ($p<0.00001$, $I^2=98\%$), so the meta-analysis of the random effect model was adopted, and the sensitivity analysis, the results before and after using the article-by-article elimination method are more consistent, indicating that the results are more robust. The results of the analysis showed that continuous nursing had a statistically significant effect on the control of glycosylated hemoglobin compared with conventional nursing [MD=-1.20, 95%CI (-2.04, -0.36), P=0.005], see Figure 6 for specifics.

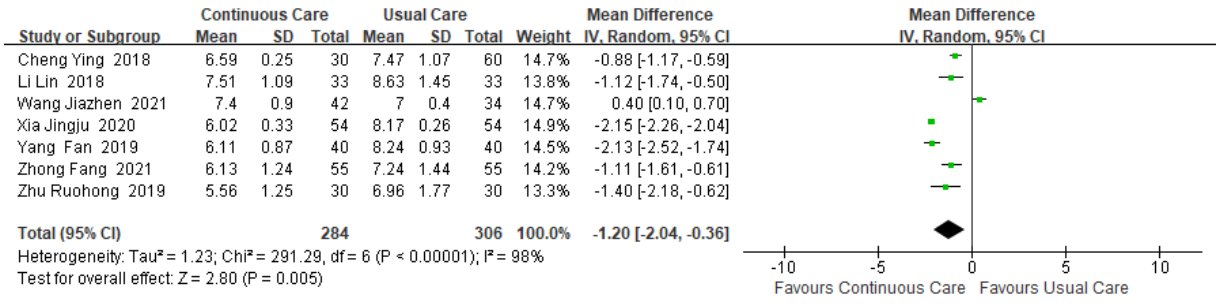

Figure 6.

4. Discussion

The age of the study population in this randomized controlled trial is ≥ 40 years old, and the 10 included literatures were comparable without statistical differences. The 10 papers were published in 2017-2021, There were 1050 patients. There are 8 papers that use the random method. One paper is randomized for the purpose of explanation, and one paper is allocated according to subjective wishes. Seven papers have not explained this method of blindness. and 2 papers did not apply the blinding method. The evaluation of the results of the included literature was relatively small, so they were all low-risk, and the quality of the literature was grade B.

The results of this study show that continuous nursing care is of great significance in improving blood sugar in patients with type 2 diabetes, which is consistent with the research results of Ruszala scholars (Ruszala, 2019). The control of fasting blood sugar has a positive effect on the pancreas; the two-hour postprandial blood sugar is of great significance to the health guidance of diabetic patients; glycosylated hemoglobin is of great significance to the prediction of chronic complications of diabetic patients. A common phenomenon is that the patient's blood sugar is well controlled through the hospital's high-quality care during hospitalization, but when the patient leaves, due to intermittent medication, irregular diet and work and rest, the patient's blood sugar is unstable, and severe complications occur. To solve this serious problem Continuous care came into being. Yan man also pointed out that continuous nursing can make up for the interruption of nursing services (Yan Man, Xu Qinyong, Zhu Guangxiang, Li Qian, & Yang Xining, 2018). When the patient goes home, Provide continuous care. By formulating a scientific and predictable nursing plan, the patient can receive comprehensive and systematic health education and basic skills, so that the patient can master the basic knowledge of blood sugar control during the discharge period, and diabetic patients Precautions for blood sugar control, so that patients can rationally regulate medication, diet and work and rest rules, and prevent readmissions caused by unstable blood sugar.

Although China's continuation of nursing started relatively late and only began to develop in the 21st century, China's continuation of care has developed rapidly. This study adopts the continuous nursing mode of the combination of online and offline. Online phone calls, online follow-up, offline nursing home follow-up, and regular patient check-ups are of great significance to the blood sugar control of patients. Through regular follow-up visits, medical staff will learn about the patient's current basic living conditions and current blood sugar conditions. If the medical staff finds problems during the follow-up, they can correct the patient's behavior in a timely manner and provide health education and guidance to the patient. If the patient cannot take care of himself, the medical staff should guide the caregiver or relatives of the patient. Therefore, continuous nursing care is of great significance to the blood sugar control and treatment of patients with type 2 diabetes. This article provides a reference for readers by systematically sorting out the application effect of continuous nursing care for patients with type 2 diabetes.

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