The impact of continuous nursing intervention on T2DM patients’ prognoses and quality of life

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Abstract: Objective: The current study aimed to investigate the effect of out-of-hospital continuous care on the blood glucose levels and quality of life of patients with type 2 diabetes mellitus (T2DM). Methods: 412 patients with T2DM were enrolled in the study and divided into a control group (n = 100) and an intervention group (n = 312). The patients in the control group received routine nursing, and the participants in the intervention group received an out-of-hospital continuous nursing intervention in addition to the routine nursing. Results: After 12 weeks of continuous nursing intervention, the total scores on the Chinese version of the Care Transitions Measure (CTM) questionnaire increased, and the fasting blood glucose (FBG) levels decreased from 8.76 mmol/L (SD = 3.01) at the baseline to 6.29 mmol/L (SD = 2.12) (P < 0.001). The FBG, 2-hour plasma glucose (2hPG), and glycated hemoglobin (HbA1c) in post-intervention levels decreased significantly in the intervention group compared to the control group. Age, the type of medical insurance, the monthly income of the individual, and the timely monitoring of blood glucose were the factors that affected the T2DM patients’ quality of life after the intervention (P < 0.05). Conclusion: Out-of-hospital continuous nursing intervention has a positive effect on glycemic control, disease awareness, and the improvement of quality of life.

Keywords: Continuous nursing intervention, CTM scores, influencing factors, quality of life

Introduction

With the changes of the disease spectrum and the improvement of people’s living standards, the number of type 2 diabetes mellitus (T2DM) patients is increasing yearly. Late-stage diabetes can lead to other serious complications, which bring economic and social burdens and seriously influence patients’ lives and health. Despite the regimens of oral medication and/or insulin for T2DM, successful glycemic control relies more on patient self-management and health education [1, 2]. However, unsuccessful glycemic control is still a challenging problem among individuals with T2DM [3]. Effective and consistent medical management reduces the glycemic level and the complications [4]. Continuous care services provide extended care for patients discharged from hospitals in China [5]. At the initial stage of the continuation care, the hospital bears significant responsibilities in the continuation of care, and the care’s quality is closely related to the patient’s outcome after the discharge and hospital experience [6]. Continuing care refers to the care outside the hospital, which makes up for the inadequacies of the hospital care, reflects the humanistic care of nursing services, and can increase the comprehensiveness of nursing.

The American scholar Coleman [7] developed the Care Transitions Measure (CTM) in 2002 to assess the quality of continuing care activities provided by hospital staff in preparing patients for discharge. The 15-item care transitions measure (CTM-15) has been endorsed by the NQF and included in the Consumer Assessment of Healthcare Providers and Systems (CAHPS) Hospital Survey in Mainland China [8]. The measure is based on a tested conceptual framework containing items relating to patients’ critical understanding, the importance of preferences, management preparation and the existence of a written and understandable care plan. Studies have demonstrated that the CTM-15 is a valuable tool for health system performance evaluation by measuring the quality of care delivered across settings [6, 7]. Bakshi et al. [9] assessed both the English and Chinese versions of this instrument in 2012. Cao et al. [8] have evaluated...
the validity and reliability of CTM-15 and its use in China.

Herein, this study will use a validated Chinese version of the CTM as a test tool to analyze the effect and influencing factors of continuous care intervention in diabetic patients in Shihezi. The effectiveness of continuous care interventions was assessed using the CTM score, blood glucose level, and the quality of life scale for patients with type 2 diabetes mellitus (DMQLS).

Materials and methods

Study subjects

At the beginning of the study, 420 patients with T2DM who were recruited from the Department of Endocrinology and Metabolism at The First Affiliated Hospital of Shihezi University School of Medicine from January to July 2019. Written informed consent was obtained from all participating patients before their enrollment in the study. The inclusion criteria were: patients diagnosed with T2DM for more than one year according to the World Health Organization criteria (Chinese Diabetes Society, 1998), patients who regularly visited the diabetes clinic for continuous treatment, patients 18-85 years old, and patients with a normal cognitive function. The exclusion criteria were: patients with serious diabetes complications, severe myocardium ischemia, and exercise contraindications, patients with neurological disorders, including cognition disorders, motor disorders, and language disorders, and patients with coagulopathy or other infectious diseases. The criteria led us to exclude 8 patients, and the remaining patients were randomly divided into the control group (n = 100) and the intervention group (n = 312). The patients in the control group received routine nursing, which included regular exercise and diet control. The nursing intervention began with the out-of-hospital patients and lasted for 12 weeks. After 12 weeks, the effective follow-up of the control group was 93, and the follow-up success rate was 93%.

The patients in intervention group were cared for as follows: First, the investigator received a Chinese version of CTM on the patient’s day of discharge. The questionnaires were administered after we explained the study to the respondents and obtained their informed consent. The respondents filled out the questionnaire by themselves. If the patient had a visual impairment or other limitation, the questionnaire could not be completed by the investigator. The investigator had to fill in the questionnaire according to the patient’s answers. But the investigator did not input any subjective views on the questionnaire, and the questionnaire was collected on the spot. A total of 312 valid questionnaires were returned. At the same time, each patient’s HbA1c and FBG levels were measured.

Second, the patients entered the continuation care stage after their discharges. We established a continuous care intervention team, including three nurses and one attending physician. The nursing staff had certain nursing skills and a high psychological literacy. The attending doctor was responsible for regular diabetes rehabilitation lectures and so on. The continuing care training for the patients included telephone follow-up, the issuance of health education manuals, the establishment of a QQ group and a WeChat diabetes exchange group, and related lectures.

Third, each subject was followed up by telephone, clinic, or community visits 12 weeks later. The follow-up included determining their CTM scores, and their recent (7 d-10 d) FBG
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Measurements

The blood glucose level measurements included FBG, 2hPG, and HbA1c. The Chinese version of the CTM questionnaire adds two items to the CTM-15, for a total of 17 items and 4 dimensions. The scale uses the Likert 4 rating, ranging from “strongly disagree” to “strongly agree”, from 1 to 4 points. Finally, the average score of the entries in terms of percentages is used as a scale score, with a higher score indicating better care transition. Conversion formula: scale score = (item average score - 1) ×100/3. The content validity index (CVI) of each entry in the Chinese version of the scale is 0.80~1.00, and the average is 0.99. The total score and the Cronbach’s α coefficients of each factor are between 0.83 and 0.85, and they have good polymerization validity and structural validity. The quality of life in the patients with T2DM was assessed using DMQLS and included disease, psychological, physical, and social scores. Higher scores indicate a lower quality of life.

and HbA1c levels were also recorded. The effective follow-up was 291 patients, so the follow-up success rate was 93.27%. A flow diagram of the data collection process is shown in Figure 1.

**Figure 1.** Flow diagram of the data collection. CTM, Care Transitions Measure; HbA1c, glycated hemoglobin; DMQLS, quality of life scale for patients with type 2 diabetes mellitus. FBG, fasting blood glucose; 2hPG, 2-hour plasma glucose.
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Statistical analysis
We establish a database using Epidata 3.1, and we implemented double data entry and consistency checks. After the data entry, SPSS 17.0 software (SPSS Inc., Chicago, IL, USA) was used for the data analysis. Cronbach’s α was used to assess the internal consistency reliability. Quantitative values are expressed as the mean ± standard deviation (SD). A univariate analysis was performed using t tests and analyses of variance. The comparisons of the proportions between two groups were done using chi-square tests. We created a forest map based on the statistical indicators and the statistical analysis method, a graph drawn from the result of a numerical operation. The SPSS-logistic regression analysis obtained odds ratio (OR) values and 95% confidence intervals (CI). An OR value greater than 1 indicated that the factor is a risk factor; an OR value less than 1 indicated that the factor is a protective factor. An item-total score correlation was calculated using a Spearman correlation analysis. Our correlation matrix analysis was generated using the R language. P<0.05 was considered statistically significant.

Results
Baseline clinical
No significant differences in terms of gender, age, body mass index (BMI), or course of disease were noted between the groups (P>0.05, Table 1).

The Chinese version of the CTM evaluation before and after intervention
The observation population (n = 312) had a CTM score of 65.10±19.50 at pre-intervention, and Cronbach’s α coefficient of the CTM was 0.871. After the intervention and eliminating the patients lost to follow-up, we found that there was a clear increasing trend in each dimension, with a total score of 69.0±18.6 points (n = 291), and the Cronbach’s α coefficient of CTM was 0.880. The score of the dimensions of the scale from high to low includes critical understanding, the importance of preferences, management preparation, and the written plan. The increase in the total CTM scores, the dimensions of the written plan, the importance of the preferences, and the management preparation were significantly different before and after the intervention, respectively (Figure 2A). The specific differences of the 17 items in the 4 dimensions before and after the intervention are displayed in Table 2. Although the Chinese version of the CTM items has a slight change from the original version, Cao et al. [8] show that the Chinese version of the CTM assessment scale has good reliability and validity. In addition, it is essential and important to note that the CTM-15 is scored as a unidimensional structure, so the domain-level structure does not have a direct impact on the scoring [6]. Briefly, the total CTM score was statistically significant compared with the score before the intervention, and the content is adequately valid.

The FBG and 2hPG levels before and after the nursing
After 12 weeks of continuous nursing intervention, the FBG level in the intervention group decreased from 8.76±3.01 mmol/L at baseline to 6.29±2.12 (P<0.05), while the FBG level before and after the routine nursing in the control group was 9.01±3.18 mmol/L and 8.04±2.57 mmol/L, respectively (Figure 2B). And the 2hPG level in intervention group decreased from 11.07±3.12 mmol/L at baseline to 8.39±3.62 (P<0.05), while the FBG level before and after the routine nursing in the control group was 10.96±3.25 mmol/L and 9.57±2.81 mmol/L, respectively (Figure 2C). An intra-group comparison suggested that the FBG and 2hPG levels after the nursing were significantly lower than they were before the nursing in both groups, and the differences were statistically significant. It can be clearly seen from Figure 2B and 2C that a decrease in the FBG and 2hPG levels after the nursing

Table 1. General clinical data (mean ± SD)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Control group</th>
<th>Intervention group</th>
<th>χ²/t</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (n, %)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>46 (46.0)</td>
<td>154 (49.4)</td>
<td>0.342</td>
<td>0.559</td>
</tr>
<tr>
<td>Female</td>
<td>54 (54.0)</td>
<td>158 (50.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>57.2±6.3</td>
<td>56.6±7.1</td>
<td>0.755</td>
<td>0.451</td>
</tr>
<tr>
<td>Course of disease (years)</td>
<td>9.3±10.1</td>
<td>9.5±9.3</td>
<td>0.183</td>
<td>0.855</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>25.6±3.7</td>
<td>25.8±3.1</td>
<td>0.535</td>
<td>0.593</td>
</tr>
</tbody>
</table>
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in intervention group were more significant \((P<0.001)\). A comparison between the control and intervention groups showed that the differences in the FBG and 2hPG levels at baseline were not statistically significant. However, after 12 weeks, the FBG and 2hPG levels in the intervention group were significantly lower than they were in the control group \((P<0.001, P<0.05)\). Taken together, the results suggest that continuous nursing intervention will exert a greater impact on the decrease in FBG and 2hPG levels in T2DM patients (Table 3).

The HbA1c levels before and after the nursing

No significant changes in the HbA1c levels were noted before and after the routine nursing in the control group. However, a significant difference in the HbA1c levels before and after the intervention was noted in the intervention group \((P<0.001)\) (Figure 2D). The difference in the HbA1c levels at baseline was not statistically significant between the two groups. After 12 weeks, the HbA1c level was significantly lower in the intervention group than it was in

Figure 2. A. A comparison of the Chinese version CTM scores before and after the intervention in the intervention group. B-D. Comparison of the FBG, 2hPG, and HbA1c levels in the intervention and control groups before and after the nursing intervention, respectively. E. Correlation analysis between the FBG, 2hPG and HbA1c levels and the CTM scores after the continuing nursing intervention in the intervention group. t test, \(***P<0.001, **P<0.01, *P<0.05\). ns: no significant difference.
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Table 2. The CTM scores before and after the nursing intervention in the intervention group

<table>
<thead>
<tr>
<th>Factor 1: Critical understanding</th>
<th>Pre-intervention (X ± s) n = 312</th>
<th>Post-intervention (X ± s) n = 291</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Understand how to take medications</td>
<td>86.66±14.76</td>
<td>90.51±15.17**</td>
</tr>
<tr>
<td>13. Understand medications’ purpose</td>
<td>86.00±15.73</td>
<td>89.33±15.82**</td>
</tr>
<tr>
<td>11. Confident could do what needed</td>
<td>83.33±18.03</td>
<td>85.67±17.72</td>
</tr>
<tr>
<td>10. Confident I knew what to do</td>
<td>81.33±17.56</td>
<td>81.92±15.63</td>
</tr>
<tr>
<td>9. Good understanding of things I was responsible for</td>
<td>78.53±17.60</td>
<td>78.57±16.87</td>
</tr>
<tr>
<td>16. Understand what makes better or worse</td>
<td>78.33±16.28</td>
<td>78.66±17.30</td>
</tr>
<tr>
<td>8. Understand disease condition</td>
<td>75.15±20.16</td>
<td>76.00±21.33</td>
</tr>
<tr>
<td>4. Had information needed for self-care</td>
<td>64.66±20.03</td>
<td>68.12±18.97*</td>
</tr>
</tbody>
</table>

| Factor 2: Importance of preferences              |                                    |                                   |
| 2. Preferences deciding health care needs       | 74.66±17.02                       | 76.92±18.76                       |
| 1. Agreed health goals and means                | 71.68±19.35                      | 75.33±18.93*                     |
| 3. Preferences deciding where needs met         | 65.66±19.30                      | 68.67±20.31                       |
| 5. Understand how to manage health              | 65.00±21.26                      | 69.89±20.62**                     |

| Factor 3: Management preparation                 |                                    |                                   |
| 17. Understand how to cope with discomfort      | 73.00±18.52                      | 76.12±17.7*                      |
| 6. Understand signs and symptoms                | 71.66±18.71                      | 75.33±19.50*                     |
| 15. Understand medications’ side effects       | 52.07±24.36                      | 55.92±22.77*                     |

| Factor 4: Existence of a written and understandable care plan (Written plan) |                                    |                                   |
| 7. Had written care plan                        | 47.27±20.73                      | 50.13±24.30                       |
| 12. Had written list of appointments and tests  | 45.33±20.51                      | 55.67±25.71**                     |
| Total                                           | 65.10±19.50                      | 69.0±18.6*                       |

1,2,3,4 Factor for the original English version of the CTM [7]. *P<0.05, **P<0.01.

In addition, we performed a correlation analysis between the CTM scores and the FBG, 2hPG and HbA1c levels in the intervention group after the continuous nursing intervention. We found that the FBG, 2hPG, and HbA1c levels were negatively correlated with the CTM scores after the intervention, respectively (Figure 2E). Taken together, the T2DM patients with high CTM scores can get better glycemic control after continuous nursing intervention.

Analysis of the influencing factors on the CTM scores after the intervention

We conducted a univariate analysis of the CTM scores after the intervention in the T2DM patients, and the results are shown in Table 3. We found that the CTM scores may not be affected by gender, medical insurance, or complications of diabetes. However, age, educational level, personal monthly income, the timely monitoring of blood glucose levels, and diabetes hospitalization history can influence the CTM score after the intervention and are statistically significant. In addition, a linear correlation analysis between age, personal monthly income, and CTM score showed that age was negatively correlated with CTM score ($r^2 = 0.5062$), but personal monthly income was positively correlated with CTM score ($r^2 = 0.5570$), as shown in Figure 3A and 3B.

A multivariate analysis of the CTM scores after the intervention

For further research, taking the CTM scores after the intervention in the T2DM patients as the dependent variable, the statistically significant variables in the univariate analysis were subjected to a multiple stepwise linear regression analysis. Age, personal monthly income,
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Table 3. A univariate analysis of the CTM scores after the intervention in intervention group

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Chinese version of CTM score</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>163</td>
<td>69.83±15.550</td>
<td>0.3991</td>
</tr>
<tr>
<td>female</td>
<td>128</td>
<td>68.25±16.211</td>
<td></td>
</tr>
<tr>
<td>Age (year old)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;40</td>
<td>30</td>
<td>71.79±8.199</td>
<td>0.0270*</td>
</tr>
<tr>
<td>40~60</td>
<td>122</td>
<td>68.22±7.419</td>
<td></td>
</tr>
<tr>
<td>&gt;60</td>
<td>139</td>
<td>66.95±10.291</td>
<td></td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school or under</td>
<td>28</td>
<td>61.18±15.992</td>
<td>&lt;0.01**</td>
</tr>
<tr>
<td>Junior high school</td>
<td>47</td>
<td>66.19±16.785</td>
<td></td>
</tr>
<tr>
<td>Senior high school</td>
<td>136</td>
<td>73.32±12.837</td>
<td></td>
</tr>
<tr>
<td>College or university and above</td>
<td>80</td>
<td>75.28±9.918</td>
<td></td>
</tr>
<tr>
<td>Personal monthly income (yuan)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2000</td>
<td>22</td>
<td>61.71±17.373</td>
<td>&lt;0.01**</td>
</tr>
<tr>
<td>2000~3999</td>
<td>96</td>
<td>66.10±13.416</td>
<td></td>
</tr>
<tr>
<td>4000~5500</td>
<td>107</td>
<td>71.39±11.523</td>
<td></td>
</tr>
<tr>
<td>&gt;5500</td>
<td>66</td>
<td>76.69±16.196</td>
<td></td>
</tr>
<tr>
<td>Medical insurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee medical insurance</td>
<td>204</td>
<td>67.92±10.236</td>
<td>0.8282</td>
</tr>
<tr>
<td>New rural cooperative medical insurance</td>
<td>46</td>
<td>68.61±11.541</td>
<td></td>
</tr>
<tr>
<td>Resident medical insurance</td>
<td>30</td>
<td>68.40±11.606</td>
<td></td>
</tr>
<tr>
<td>Self-paying</td>
<td>11</td>
<td>70.79±8.4055</td>
<td></td>
</tr>
<tr>
<td>Monitor blood glucose on time</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>75</td>
<td>63.34±15.948</td>
<td>&lt;0.01**</td>
</tr>
<tr>
<td>Yes</td>
<td>216</td>
<td>74.65±10.424</td>
<td></td>
</tr>
<tr>
<td>Diabetes hospitalization history</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>88</td>
<td>61.85±10.330</td>
<td>&lt;0.01**</td>
</tr>
<tr>
<td>Yes</td>
<td>203</td>
<td>76.06±11.369</td>
<td></td>
</tr>
<tr>
<td>Complications of diabetes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>212</td>
<td>68.56±6.597</td>
<td>0.2998</td>
</tr>
<tr>
<td>Yes</td>
<td>79</td>
<td>69.45±6.229</td>
<td></td>
</tr>
</tbody>
</table>

*P<0.05, **P<0.01.

Figure 3. Linear correlation analysis of age (A), personal monthly income (B), and the post-intervention CTM scores (n = 291).

Figure 3. Linear correlation analysis of age (A), personal monthly income (B), and the post-intervention CTM scores (n = 291).

Logistic regression analysis

The CTM scores after the intervention were divided into high and low groups, CTM>61.0...
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Table 4. A multiple stepwise linear regression for the factors in the intervention group

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>SE</th>
<th>β’</th>
<th>t</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>48.349</td>
<td>2.248</td>
<td>-</td>
<td>21.505</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Personal monthly income</td>
<td>-1.364</td>
<td>0.344</td>
<td>0.193</td>
<td>3.964</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Medical insurance</td>
<td>-1.151</td>
<td>0.373</td>
<td>-0.149</td>
<td>-3.082</td>
<td>0.002</td>
</tr>
<tr>
<td>Age (years old)</td>
<td>-1.451</td>
<td>0.489</td>
<td>-0.148</td>
<td>-2.969</td>
<td>0.003</td>
</tr>
<tr>
<td>Monitor blood glucose on time</td>
<td>1.352</td>
<td>0.644</td>
<td>0.104</td>
<td>2.098</td>
<td>0.036</td>
</tr>
</tbody>
</table>

The argument assignment: Age, <40 years = 1, 40~60 = 2, >60 = 3; personal monthly income, <2000 yuan = 1, 2000~3999 yuan = 2, 4000~5500 yuan = 3, >5500 yuan = 4; Types of medical insurance, employee medical insurance = 1, new rural cooperative medical insurance = 2, resident medical insurance = 3, self-paying = 4; monitor blood glucose, no = 0, yes = 1.

In recent years, more and more scholars have begun to study continuation nursing, and the hospital has assumed important responsibilities as the initial stage of continuation nursing [10-13]. Out-of-hospital continuing nursing is an extension of clinical care. It extends medical care to the outside of the hospital, enabling patients to receive timely and correct guidance on disease-related knowledge after discharge to improve their self-management and compliance behavior. Herein, the current results found that an increase in the Chinese version of the CTM scores through short-term continuous nursing intervention, particularly the importance of preferences and written plan factors. After the intervention, the FBG, 2hPG, and HbA1c levels were significantly reduced, and the disease awareness and the Chinese version CTM scores were increased in the intervention group. The quality of life was also greatly improved compared to the control group. This also indicates that individualized continuous care can effectively control T2DM patients’ glycemic levels and improve their quality of life.

In our research, the Chinese version CTM scores in the patients with T2DM in pre-intervention was 65.10±19.50, and the post-intervention score was 69.0±18.60. This is slightly lower than the scores reported in the literature [14, 15]. The difference may be attributed to the dissimilar healthcare policies in China and other countries. In China, many scholars have made positive attempts at the continuous care of chronic diseases, but they are all in their infancy and exploration. And for continuous care, there is no support for health insurance policies. Continuing care in our hospital and surrounding areas are still in its infancy. The nursing staff is not sufficiently proficient in continuous diabetes care, which may also be one of the reasons for the low CTM scores in our study. With regard to the reliability analysis, we found that the Cronbach’s α values of the CTM were 0.871 and 0.88, which are in parallel with the results of previous studies [6, 9, 16, 17]. This also suggests that studying is reliable.

Currently, blood glucose levels are the most direct indicator of glycemic control in patients with T2DM. And changes in the FBG, 2hPG, and HbA1c levels are important indicators of diabetic diagnosis and prognosis [18, 19]. In
the current study, continuous nursing intervention exhibited advantages over routine nursing in the reduction of HbA1c, FBG, and 2hPG levels. These results are similar to those previously reported [3, 20, 21], which indicates that targeted nursing intervention can help in glycemic control.

In addition, the FBG, 2hPG and HbA1c levels were negatively correlated with the CTM scores after the intervention. This indicates that T2DM participants with high CTM scores can achieve better glycemic control. Our analysis of the influencing factors of the Chinese version CTM scores after the continuous nursing intervention in T2DM patients showed that the level of personal monthly income was positively correlated with CTM scores and age was negatively correlated with CTM scores after the intervention in T2DM patients. Simultaneously, age is a risk factor for low CTM scores (OR = 1.485), and personal monthly income is a protective
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Factor for low CTM scores (OR = 0.552) according to our logistic regression analysis. The treatment of diabetes is a long-term process that requires lifelong medication. Those with high incomes have better medical security, can face diseases with a healthier and more positive attitude, and have an enhanced self-confidence in overcoming diseases. With the increase of age, due to the decline in physical function, cognition, memory, and understanding of mobility (including the lack of WeChat QQ operation), it is difficult for patients to master disease knowledge and practice healthy behavior. Therefore, this also reminds medical staff to choose quiet places for health guidance for elderly patients, and to use the teach-back method for one-on-one health education. If conditions permit, the patient and family can communicate with each other to improve the effectiveness of the health guidance. In addition, through the correlation matrix, we found that there was a positive correlation between educational level and personal monthly income, and diabetes hospitalization history and medical insurance, respectively. One’s diabetes hospitalization history and personal monthly income, and the timely monitoring of blood glucose and the complications of diabetes have significant negative correlations, respectively.

Frankly, the relatively short research period and the relatively simple assessment of the quality of life are the disadvantages of this experiment. Therefore, long-term and more detailed intervention studies including patient rehabilitation evaluation and the impact of complications will also be of great value in the future. In summary, our study found that out-of-hospital continuous nursing intervention helps control patients’ glycemic levels more effectively and improves their quality of life.

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Disclosure of conflict of interest

None.

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References


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