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Original Article

The current status of foot self-care knowledge, behaviours, and analysis of influencing factors in patients with type 2 diabetes mellitus in China

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ABSTRACT

Purpose: To investigate the knowledge and behaviours on foot self-care in patients with type 2 diabetes mellitus; analyse the influential factors, and provide information for the intervention study.

Methods: A total of 5961 patients with type 2 diabetes mellitus from 144 hospitals in China were included in the study. The investigation content included patients' demographic data, foot self-care knowledge and behaviours. The investigation tools were the questionnaires on the general diabetes information, on the foot self-care knowledge, and on the foot self-care behaviours.

Results: The foot self-care knowledge was medium and the foot self-care behaviour was poor. The status of knowledge and behaviours were influenced by education, duration of diabetes mellitus, periodic inspection, and education about diabetic complications. Pearson analysis demonstrated that there was positive correlation between knowledge score and behaviour score ($r = 0.27$, $p < 0.001$).

Conclusions: The status of foot self-care knowledge and behaviours are not optimistic. According to the patients' own characteristics, the theory of knowledge, attitude and practice applies to encouraging patients to go for periodic inspection and education about diabetic complications so as to enhance the knowledge and promote the self-care behaviours.

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1.   Introduction

Diabetes is a life-long disease, difficult to treat, often causing a variety of acute and chronic complications, seriously affecting the patient's quality of life. Diabetic foot is one of the main chronic diabetic complications. Despite medical advancements and prevention reports, the incidence rate of diabetic foot and morbidity remain high across the world [1]. Patients who had to suffer from amputation operation accounted for about 5%–10%, which is more than 50% of all non-traumatic amputation [2]. The right foot care, good blood glucose control, and the diabetes education can prevent up to 85% of the diabetic foot amputations [3]. Others have shown reduction in the foot amputation rate from 0.8% to 0.5% when appropriate diabetic foot care and education are implemented [4].

The aims of this study were to investigate the current status of the foot self-care knowledge, the foot self-care behaviours of patients with diabetes, to analyse the influencing factors, and to provide basis for related intervention researches.

2.   Design and methods

2.1.   Subjects

This cross-sectional research on type 2 diabetes patients used the convenience sampling method from April to July in 2010. The patients' information was collected from 50 research centres and 144 hospitals located across 31 Chinese provinces. And 50 hospitals were municipalities directly under the central government while others 94 hospitals were. To avoid the selection bias, each research centre cooperated with at least one community hospital during the investigation, patients from autonomous regions hospital occupied more than 10% of the total number of the centre. Sample inclusion criteria were: (1) type 2 diabetes diagnosis according to the WHO 1999 guidelines [5], (2) diagnosed with type 2 diabetes for >1 year, and (3) agreed to participate.

A total of 6043 questionnaires were distributed. Unqualified questionnaires were eliminated resulting in a total of 5961 questionnaires included in the study. The number of tertiary hospital patients was 5338 (89.55%). There were 623/5961 (10.45%) of community hospital patients. There were 3233/5961 (54.24%) male patients and 2728/5961 (47.76%) female patients. The patient age ranged from 16 to 94 years with average age being 59.50 ± 12.48 years. The duration of patient's diabetes was from 1.08 to 44.95 years, and the average was 8.79 ± 6.85 years. The number of patients with diabetic foot was 332/5961 (5.60%); the duration were 0.08–41.67 years, median was 0.96 years.

2.2.   Surveys

2.2.1.   General information
The portion of the questionnaire on the general patient information included gender, age, educational level, occupation, marital status, number of children, personal income, living habits, duration of diabetes treatment, annual check-ups (at least once a year), willingness to accept educational pamphlets provided by hospitals or community organization, acute or chronic complications, medical cost, and laboratory examination results (see Table 1).

2.2.2.   Foot care knowledge questionnaire
Foot care knowledge questionnaire was developed using researchers' previous knowledge and experience as well as published information. This part of the questionnaire included six questions regarding the foot-care knowledge health providers would want patients suffering from diabetic foot to know: foot examination, foot care, foot nails trimmed, the treatment of foot problems, shoe type selection, and the processing of foot skin. Each item had "true", "false" and "do not know" options. A true answer equalled 1 point, other options equalled 0 points. The maximum number of points was 24, indicating good foot-care knowledge. In the preliminary experiment 30 patients were selected, and interval measurements were taken for 2 weeks using the same questionnaire. Formula for calculating the standard score was,

$$\text{The standard score} = (\text{the actual score}/ \text{the highest possible score}) \times 100.$$

The standard score <60 was considered "poor", 60–80 was "medium", and ≥80 was "good" knowledge of foot self-care [7].

2.2.3.   Foot self-care behaviour questionnaire
A questionnaire on foot self-care behaviour developed by Toobert DJ, the Summary of Diabetes Self − Care Activities (SDSCA), was used to evaluate self-care behaviour in patients [8]. Prior to use by graduate students and doctors, the questionnaire was translated and converted to the Chinese scale used in endocrinology. Diabetes experts were hired to validate the content of evaluation, and select one of the 30 patients to do preliminary research centre survey [6]. The 30 patients chosen for the preliminary study had to answer five specific questions in the questionnaire on the foot self-care behaviour questionnaire: 1) "on how many of the last seven days did you check your feet"; 2) "on how many of the last seven days did you inspect the inside of your shoes"; 3) "on how many of the last seven days did you wash your feet"; 4) "on how many of the last seven days did you soak your feet"; 5) "on how many of the last seven days did you dry between your toes after washing". Each answer was ranked from 0 to 7; the higher the score, better the foot self-care behaviour was. Using the norm analysis the standard score was calculated as follows:

$$\text{The standard score} = (\text{the actual score}/ \text{the highest possible score}) \times 100.$$

The standard score <60 was considered "poor", 60–80 was "medium", and ≥80 was "good" foot self-care behaviour [7].

2.3.   Statistical analysis

Data were analysed using Student's t test, analysis of variance, correlational and multiple regression analyses. The SPSS17.0 software (SPSS Inc., Chicago, IL, USA) was used to analyse the data. Data were presented as mean ± standard deviation, and a $p < 0.05$ was considered statistically significant (see Table 2).