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Review Article

Research Development of Disease Pain in Elderly Patients with Type 2 Diabetes

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Abstract: This paper describes the current status of research on disease distress in elderly type 2 diabetic patients at home and abroad, with a view to developing targeted interventions for diabetic patients, improving self-management behavioral ability and quality of life in elderly type 2 diabetic patients, and improving patients' glycemic control.

Keywords: Elderly; Type 2 Diabetes Mellitus; Disease Suffering; Research Progress

1. Background

Diabetes mellitus is a lifelong metabolic disease that affects human health worldwide. China's 7th population census [1] showed that China's elderly population accounted for 18.70% of the total population, totaling about 206.4 million people, and elderly diabetic patients accounted for 30% of China's elderly population, of which 95% were type 2 diabetic patients. Once diagnosed, diabetes not only requires lifelong medication to control blood glucose, but also has high requirements for daily diet, exercise, and blood glucose monitoring, making it a major source of stress in patients' daily lives. Domestic and international scholars refer to the negative emotions produced by diabetic patients facing the complex problems accompanying life with diabetes, such as self-management behaviors, emotional burdens, and treatment pressures, as disease distress [2]. Elderly people are vulnerable to disease suffering due to the decline in physical function, longer duration of the disease, and greater rates of disability and death from complications [3-4]. Several studies have shown that research [5-8] indicates that 26% to 40% of elderly type 2 diabetes mellitus patients have moderate or severe levels of disease pain, and the disease pain emotion of elderly patients deserves the attention of medical personnel. Up to now China for elderly type 2 diabetes patients with disease pain related research is less, this paper describes the current status of the study of elderly type 2 diabetes patients with disease pain at home and abroad, the clinical development of targeted interventions for diabetic patients, to improve the ability of elderly type 2 diabetes patients to self-manage their behavior and the quality of life, and to improve the patient's glycemic control to provide a basis.

2. Suffering from Disease

Disease distress is a series of negative emotional responses produced by diabetic patients in the process of coping with the complexity of living with diabetes, and there is no authoritative organization to define it uniformly. Different scholars also have slightly different definitions of it. Currently recognized by scholars in China is the definition of Fisher et al [9], which considers disease distress as an emotional response of diabetic patients to concerns about diabetes-related disease management, disease support,

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emotional burden, and treatment options, and emphasizes that disease distress originates from a specific context. Elizabeth A et al [10] and others emphasize the difference between disease distress and depression, and they believe that disease distress causes and diagnostic criteria are different from major depression, and that illness distress is a negative emotion in people with diabetes resulting from the need for self-care, the likelihood of developing serious complications in the future, the quality and cost of medical care required for the disease, and the lack of support from family or friends.

3. Disease distress measurement tool

3.1. Disease distress measurement tool

In 1995, POLONSKY et al. [11] designed the Problems in Diabetes Scale (PAID Scale) for diabetic patients (type I and type II) at the level of psychosocial adaptation by recruiting 451 female diabetic patients through questionnaires and patient interviews, which consisted of 20 items to assess the negative emotions of diabetic patients after treatment. The scale consists of 20 entries in 4 dimensions (negative emotions, treatment, diet, and social support) and is scored on a 6-point Likert scale (from "no problem" to "very serious problem", with values ranging from 0 to 5, respectively), with the higher the total score, the more serious the emotional burden experienced by the patient. The higher the total score, the more serious the emotional burden experienced by the patient, and the scale can effectively measure negative emotions in diabetic patients. It has been translated and used in many countries (regions). In 2010, our Taiwanese scholars, HUANG [12] et al. first Chineseized PAID-C as PAID, which was tested to have good reliability and validity and suitable for the measurement of negative emotions of diabetic patients in China. In 2013, our scholars, Hsu HC [13] et al. believed that the length of the 20 entries in PAID-C would limit the application of this scale in clinics, so on the basis of this development, we developed a brief and simple scale to measure negative emotions. Therefore, the short and valid SF-PAID-C scale was developed on this basis, which contains only 8 entries with a Cronbach's of 0.85 and has good reliability and validity. It is worth noting that due to the fact that Taiwanese diabetic patients enjoy a more satisfactory health care program, they are generally satisfied with the level of medical care [14], and the aspect of disease healing care has little impact on the generation of their negative emotions, so the SF-PAID-C scale does not include social support as a problem dimension, which is not in line with the reality of diabetic patients in mainland China, and in 2015, our scholars, Yang Liping et al [15] conducted a cultural debugging of the SF-PAID-C scale, still retaining eight entries, using the Likert 5-level scoring method, and conducted a survey and research on 118 elderly patients with type 2 diabetes mellitus through random sampling, which proved that the Cronbach's of the debugged SF-PAID-C scale was 0.8, with good internal consistency, which is suitable to be used for the investigation of the emotional disturbances of diabetes mellitus in the elderly patients. type 2 diabetic patients with diabetic emotional distress related problems.

3.2. Diabetes Distress Scale

The Diabetes Distress Scale (DDS) was developed by Polonsky et al [16] in 2005 as a scale specifically designed to measure patients' disease distress: the scale is divided into four dimensions, namely, emotional burden-related distress, physician-related distress, life routine-related distress and The scale is divided into four dimensions, namely, emotional burden-related pain, doctor-related pain, life routine-related pain and interpersonal relationship-related pain, with a total of 17 entries, which are scored on a Likert 6-point scale, with each question scored from no effect to very serious, in order of 1 to 6 points. The DDS scale Cronbach's $\alpha = 0.93$ and the subscales Cronbach's α were 0.88

to 0.90, with good internal consistency. The scale was divided into tiers by the mean score of the total entries, with <2.0 as no or mild pain, 2.0 to 3.0 as moderate pain, and ≥3.0 as severe pain [17].In 2010, our scholars, Yang Qing et al [18], translated the DDS scale into Chinese, and the resulting Chinese version of the total scale of disease pain and the Cronbach's α coefficients of the dimensions of the scales were 0.84-0.95, retest reliability coefficient of 0.84-0.88, good reliability and validity evaluation, has been widely used in China [19-21].

4. Factors Influencing Disease Distress in Older Adults with Type 2 Diabetes Mellitus

4.1. Gender

Azadbakht M et al [22] in a cross-sectional study of 519 elderly Iranian patients with type 2 diabetes mellitus found that females were significant predictors of disease distress, and in addition to cultural differences, they believed that females were more willing to talk about their emotions and seek help, while males perceived the expression of stress or worry as a sign of weakness, and were more willing to seek solutions to their problems and try to overcome their difficulties. In our related studies [23-24], gender (female) was also found to have a certain correlation with disease suffering, which is related to the fact that female patients are more emotionally sensitive and fragile, and their ability to resist stress is lower than that of men. It was found [25] that female type 2 diabetes mellitus and male patients had different factors affecting disease distress, with more risk factors associated with female patients (e.g., younger age, insulin therapy, higher glycated hemoglobin, lower cognitive ability, difficulty in dietary compliance, and poor glucose monitoring) compared with those associated with male patients (high glycated hemoglobin, difficulty in dietary compliance, depression, and lower self-health ratings), which may increase the incidence of disease distress in female patients.

4.2. Course of the disease

Several studies have shown [24, 26-27] that disease duration is an independent influence on disease distress in elderly patients with type 2 diabetes. However, the mechanism of its influence is still unclear. Our scholars Wang Xiaoyan et al [24] pointed out that due to the decline of physical function in elderly patients with type 2 diabetes mellitus, the longer the duration of the disease (>10 years), the more difficult it is to control the patient's blood glucose, and at the same time, the more likely to be complicated by comorbidities, and therefore, the patient's level of disease suffering is higher. And Iranian scholars Azadbakh M et al [22] pointed out that the elderly in the range of disease duration ≤ 10 years of disease suffering mood is the highest, in the 1~10 years of the patient for diabetes knowledge, glycemic control and the threat of complications can not have enough knowledge and skills, easy to have bad mood, with the extension of the disease duration, diabetic patients for the knowledge of diabetes, glycemic control of the skills of the patient is increasing, and patients for diabetic daily life and glycemic control of skills. As the duration of the disease increases, diabetic patients' knowledge of diabetes and skills of glycemic control increase, and patients have more confidence in coping with diabetes in daily life and glycemic control, so the patients have less distressing emotions, which may be related to the difference in the level of health care between the two countries.

4.3. Blood Glucose Control

Blood glucose level, as a direct indicator of the effectiveness of disease treatment and disease management, has a direct effect on the mood of elderly type 2 diabetic patients. He Jinfeng et al [21] found that glycemic control was negatively correlated with disease pain, and poor glycemic control would cause frustration and physical and psychological

stress in elderly patients with type 2 diabetes mellitus. Jeong M et al [28] concluded that as glycemia becomes more difficult to control, the greater the pressure on glycemic control in elderly patients, and the higher the level of disease pain, and that smooth glycemia can increase elderly patients' disease management confidence, improve patients' adherence to self-management behaviors, and reduce disease pain [29]. confidence, improve patients' adherence to self-management behaviors, and reduce disease distress [29]. Tunsuchart et al [30] found that blood glucose levels were highly correlated with overall disease distress levels, affective burden dimensions, and regularity burden dimensions, which the authors believed was related to the many demands that arise from poor glycemic control as well as disappointment and frustration with the outcomes of self-management behaviors, and noted that future cohort studies to clarify the causal relationship between blood glucose levels and disease distress interactions.

4.4. Diabetic complications

Complications of diabetes are one of the biggest concerns of diabetic patients, and the presence or absence of complications not only directly reflects the control of the patient's condition, but also affects the patient's quality of life, treatment modalities, and the burden of medication. 2009, Fisher et al [31] found that complications increase the pain and suffering of the patient in a longitudinal study of 506 community-dwelling patients with type 2 diabetes mellitus over a period of 18 months, and found that the probability of the occurrence of diabetes mellitus was higher than the probability of the occurrence of diabetes mellitus. the probability of occurrence. Liang Yin [32] conducted a cross-sectional survey of 216 hospitalized middle-aged and elderly patients with type 2 diabetes and found that the more diabetic complications patients had, the higher the disease suffering. Li Dan [33] on 253 hospitalized elderly patients with type 2 diabetes mellitus survey found that diabetic retinopathy is the majority of elderly patients in the survey, and retinopathy not only increases the cost of medical care, but also causes the patient's dependence on life, social dysfunction, and other problems, increasing the patient's psychological burden.

4.5. Treatment modalities

The treatment modality reflects the condition of diabetic patients to a certain extent, and the more complex the treatment modality is, the more difficult it is to control the patient's blood glucose. Liang Yin [32] showed that the level of disease distress in patients treated with oral medication combined with insulin was much higher than that in patients treated with oral medication alone, which could be attributed to the fact that due to the cumbersome medication administration, it is more difficult for patients to comply with medication, and the patients become frustrated with the management of diabetes mellitus. The same findings were also found by Amankwah-Poku M [34], that compared to the patients treated with only lifestyle changes or taking oral medication alone, the elderly patients were more difficult to accept the insulin treatment regimen, partly because of the complexity of insulin administration. Amankwah-Poku M [34] also showed the same findings that insulin treatment regimen is more difficult to accept by elderly patients compared to only lifestyle changes or simply taking oral medications, partly because insulin administration is more complicated and requires more effort and medical expenses, and partly because injecting insulin is an invasive operation, which causes unbearable physical and mental stress to the patients. Complex antidiabetic drug regimens may be associated with high levels of diabetes-related distress. Luzuriaga et al [25] found in a retrospective study that complex antidiabetic drug regimens were associated with high levels of diabetes-related distress, and they concluded that the more complex the regimen, the lower the patient's adherence to the medication, the worse the

level of glycemic control, and the higher the level of patient's disease distress, forming a vicious cycle.

4.6. Social support

Social support refers to the emotional or material support provided to an individual by friends, family, relatives and formal or informal organizations, which is a psychosocial resource for an individual that enables patients to cope with difficulties positively. Hsu Hui-Wen et al [35] showed that patients' social support was negatively correlated with disease suffering, i.e., the better the social support indicated that the more material and emotional support patients received, the more confident they were in disease treatment, and the more they were able to cope with their disease suffering positively. Young CF [36] et al. conducted a cross-sectional survey of 101 middle-aged and elderly diabetic patients, and the results showed that higher social support was associated with a lower level of disease suffering was associated. Zhang Yi et al [37] conducted a cross-sectional survey on 95 hospitalized elderly diabetic patients, and the results of the study showed that disease distress was negatively correlated with social support in elderly diabetic patients, and it was concluded that the establishment of a social network and the acquisition of social support in elderly patients are important for the positive emotional experience and the development of psychological health.

4.7. Ways of responding

Coping styles refer to the cognitive or behavioral efforts of individuals to mitigate the physical and psychological harm to themselves in the face of a stimulus event [38]. Currently coping styles are categorized into positive and negative coping styles. Positive coping styles are conducive to reducing stress intensity and stress injuries and obtaining good coping outcomes, while negative coping styles can increase stress intensity, increase stress injuries, and exacerbate the consequences of adverse events [39]. A meta-analysis on coping styles in adults with type 2 diabetes [40] found that positive coping styles were effective in lowering glycated hemoglobin and obtaining better health benefits in diabetic patients, whereas negative coping styles increased anxiety and depression in patients. Fei-Zhu Liang et al [41] conducted a cross-sectional survey of 105 elderly patients with type 2 diabetes mellitus and found that there was a significant correlation between coping styles and patients' disease distress, positive coping styles could reduce patients' disease distress, and coping styles are important mediating variables of stress and stress response, which play an important role in patients' mental health.

5. Interventions for Disease Distress in Older Adults with Type 2 Diabetes Mellitus

5.1. Mindfulness Intervention

Positive thinking therapy advocates an open, accepting, and go-with-the-flow attitude toward current negative thoughts, negative emotions, and illnesses. Several studies [42-44] have demonstrated the significant effect of positive thinking therapy on the adjunctive treatment of various psychological disorders and chronic diseases. Lisa Cai et al [45] conducted a randomized controlled trial on 83 elderly type 2 diabetic patients in the community, the control group was given conventional care, and the observation group was given positive thinking therapy intervention on the basis of conventional care. Zhang Hongmei et al [46] conducted a meta-integration analysis of orthomolecular therapy in diabetic patients, the results showed that orthomolecular therapy can effectively reduce the level of pain in diabetic patients, but there is no significant difference in the effect of the patient's glycated hemoglobin level, this conclusion differs from the results of the study of Cai Liza et al. The analysis of the reasons for this may be related to the length of

the intervention time, and need to be further confirmed by subsequent relevant studies. It needs to be further confirmed by subsequent related studies. Positive thinking therapy is mostly an operation performed by psychologists for patients, Guo J et al [47] in order to explore the feasibility of the operation of the nursing staff, nurses to 100 hospitalized patients with type 2 diabetes mellitus to carry out positive thinking intervention, the results show that nurses to implement positive thinking therapy has the feasibility of improving the level of diabetic patients with glycated hemoglobin, reduce the level of patients' disease pain.

5.2. Peer-to-peer education

Peer education [48] is an educational model of sharing treatment experience by a peer group leader who has better disease control and experience in disease management to group members with similar age, hobbies, social and other aspects and the same experience of the disease, which is a form of social support, and is being increasingly used in diabetes management. Zhou Ting et al [49] conducted a randomized controlled trial on 128 hospitalized elderly patients with type 2 diabetes mellitus, in which the control group was given conventional diabetes education, and the observation group was given peer education on the basis of the control group, and after two months of intervention, the results found that peer support could effectively alleviate the psychological pressure of patients. Yao Li [50] in the peer education on the impact of disease pain research found that peer education in the total disease pain score, doctor-related pain, life routine-related pain, interpersonal relationship-related pain dimensions have a significant difference in the peer education group disease pain scores are significantly lower than the conventional group scores, while in the emotional burden dimensions of the non-significant, the reason may be related to the conventional health education has been able to effectively reduce the patient's emotional burden, the control group and the observation group in the emotional burden, the control group and the observation group in the emotional burden of the patients. Therefore, the difference between the control group and the observation group in the dimension of emotional burden was not statistically significant. Wu Liqin et al [51] used peer education methods in the form of regular group activities, telephone follow-up, and micro letter group communication to conduct a 3-month intervention for 36 diabetic patients and evaluated the patients' self-management behaviors, glucose monitoring behaviors, and changes in glycemic indexes, and found that peer education could improve the level of patients' self-management behaviors, glucose monitoring behaviors, and glycemic indexes, and could also fill the gap between patients with diabetes specialties. The results showed that peer education can improve patients' self-management behavior, blood glucose monitoring behavior and glucose metabolic indexes, and also can fill the relative shortage of diabetes specialist nurses, which is worth promoting.

6. Conclusion

Disease pain should not be ignored in elderly patients with type 2 diabetes mellitus, and the identification of disease pain is of great significance to the health outcomes of elderly patients. Currently, there is no short and feasible clinical screening tool for disease pain in China, and it needs to be further developed and researched. Although pain interventions are effective, they are not widely used due to time and place constraints, as well as differences in patients' cultural backgrounds. The development of Internet technology has facilitated various forms of interventions. In the future, traditional interventions can be combined with the Internet to break through the time and place limitations, so that elderly patients can enjoy convenient and effective diagnostic and

treatment services, improve the level of patients' self-management behaviors, reduce the status quo of disease pain, and ultimately improve the prognosis of patients.

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