Advances in finding benefits for patients with diabetes

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Abstract
The etiology of diabetes is complex, the course of the disease is long, patients are easy to appear negative emotions, leading to a decline in the quality of life, with the rise of positive psychology, the positive psychology of diabetes patients has become a research hotspot of scholars, benefit finding is one of the hallmarks of positive psychology. This paper reviews the concepts, assessment tools and influencing factors of benefit discovery in patients with diabetes, aiming to provide reference for promoting the physical and mental health of patients with diabetes.

Keywords: diabetes mellitus; benefit finding; measuring tools; influencing factors; interventions
Introduction

According to the latest data released by the International Diabetes Federation (IDF) [1], the number of people suffering from diabetes worldwide has reached 537 million, and the incidence is still growing and the trend is younger, and it has become an important public health problem threatening human health. As an incurable disease, diabetes has a high rate of re-hospitalization and is prone to complications, which brings physical and mental pain to patients [2]. With the penetration of positive psychology into various disciplines, researchers no longer focus on the negative impact of diseases on patients, but focus on the positive psychological changes generated during their illness. The concept of benefit discovery is one of the representatives of positive psychology [4, 5]. Previous studies on benefit discovery mainly targeted cancer patients [6, 7], chronic patients [8, 9], caregivers [10, 11] and nursing staff [12, 13], etc. In recent years, more and more studies have begun to pay attention to the benefit discovery level of diabetes patients [14, 15], but few scholars have summarized it. This article reviews the assessment tools, influencing factors and intervention measures for the benefit discovery of diabetic patients, in order to provide basis for the development of personalized physical and mental care programs for diabetic patients.

Overview of benefit findings

Benefit discovery belongs to the category of positive psychology, which has not been uniformly defined by domestic and foreign literatures. Taylor proposed the cognitive adaptation theory in 1983, pointing out that when individuals face stressful events, they often make positive changes in cognition and behavior, which can bring benefits to their lives. This theory constitutes the early prototype of the concept of “benefit discovery” [16]. Since then, scholars at home and abroad have explored from different angles and enriched the connotation of benefit discovery. Tennen et al. pointed out that benefit discovery takes meaning creation as the guiding theory and promotes individual positive change through reevaluation of adverse life events [17]. Helgeson et al defined benefit discovery as identifying positive effects from traumatic events [18]. Based on this, in the early stage of stressors, the benefit discovery may be a cognitive coping strategy that positively directs physical and mental health, while in the later stage, it reflects the result of spiritual growth [19]. A paper believes that benefit discovery is a protective psychosocial resource, which can buffer negative emotions and protect individuals from the negative effects of stressors when facing stressful events [20]. Tran et al believe that benefit discovery reflects the process of personal growth and adaptation, and promotes the participation of adolescent diabetic patients in identity exploration [21], which shows that benefit discovery is an important resource for adaptation to the disease [22]. The scholar Liu Fenge of our country first introduced the concept of “benefit finding” and translated it into “finding meaning”, pointing out that individuals finding the meaning of life in adversities is one of the coping ways [23]. Liu Tuoqun and other scholars pointed out that beneficial discovery refers to the positive changes in disease diagnosis, treatment and survival of patients with diseases [24]. Now scholars have defined it as benefit finding, and its core is to shape innovative thinking in the face of adversity, to explore the positive meaning of traumatic events, so as to improve the ability to cope.

Assessment tools for benefit discovery

Benefit Finding Scale (BFS)

Antoni et al. developed BFS in 2001 to measure the positive psychological changes of breast cancer patients, with a total of 17 items in one dimension. The Likert 5-point scoring method was adopted, and Klonbach coefficient was 0.95 [25]. With the development of positive psychology, domestic and foreign scholars have made cross-cultural adjustments to the original scale according to the specific language environment of their own countries, and formed an assessment tool suitable for discovering the benefits of diseases for domestic patients. In order to study the correlation between the course of breast cancer and the discovery of benefits, Tomich et al. improved the scale in 2004, forming a single-dimensional scale with 20 items and adopting a 4-level scoring method. The higher score, the more benefits will be obtained, and the Klonbach coefficient was 0.92 [26]. In 2014, with the consent of the original author Helgeson, Chinese scholar Hu Ye translated, revised and verified the 2004 version of BFS according to Chinese expression habits, and finally formed a self-assessment scale of benefit discovery that was in line with China's cultural background. There were 19 items of Chinese BFS, with Klonbach coefficient of 0.911. Its content is simple and easy to understand, clinically feasible, and has been widely used in cancer patients and chronic disease patients in China [27]. Domestic scholars used the sinicized BFS to evaluate the benefit finding level of diabetic patients, and Klonbach coefficient was all above 0.9 [28, 29]. In 2013, Chinese scholar Hu Jing compiled a scale for the benefit finding of nursing staff based on China's national conditions and language habits, which can be divided into 5 dimensions and 33 items, and the Klonbach coefficient of the scale is 0.958, which is widely used in clinical medical staff in China [30]. In 2018, Zhang Lei compiled BFS for elderly patients with chronic diseases based on the current situation of aging in China, which were divided into 6 dimensions and 26 items. The total Klonbach coefficient of the scale was 0.924, the subscale was 0.74 – 0.90, and the retest reliability of the total volume scale and subscale were both above 0.78. It is shown to have good reliability and validity [31]. It can be seen that there are more specific scales for cancer patients and caregivers, and there is a lack of specific scales for benefit discovery in T2DM patients. Therefore, benefit discovery tools for diabetes can be developed in the future.

Posttraumatic Growth Inventory (PTGI)

In 1996, American scholar Tedeschi et al. compiled PTGI [32], which is used to evaluate the traumatic experience of others after suffering an accident, including 21 items and 5 dimensions: Interpersonal relationship, new possibilities, appreciation of life, spiritual change and personal strength were selected by Likert 6-level scoring method, from “no change at all” to “a lot of change”, 0-5 points were given in sequence. The higher the score, the more post-traumatic growth was indicated. Klonbach coefficient of the scale was 0.90. This scale has been widely used in different populations and has been translated into Spanish, German, Japanese and other versions [33, 34]. Ho et al. from Hong Kong revised PTI into traditional Chinese and applied it to cancer patients, and its Klonbach coefficient was 0.825 [35]. Since simplified Chinese is the main language in China, Wang Ji conducted language adaptation and reliability test on PTGI in 2008, and the Klonbach coefficient of consistency reliability ranged from 0.611 to 0.874. The revised scale is suitable for the study on post-traumatic growth of accident victims in China [36].

3 Benefits found in the area of public health impact

Low and middle income countries are the main gathering places of diabetes. China, as the largest developing country in the world, has a large and aging population, so it has a more severe situation of diabetes [37, 38]. The disease of diabetes is protracted and cannot be cured. Once diagnosed, patients need lifelong medication, and the high treatment cost has brought great troubles to the global economic development and health care system [39, 40]. It is well known that blood glucose control and regular medication are key factors for good diabetes control [41]. This positive psychology encourages patients with diabetes to have a correct understanding of the disease [28, 29], peacefully accept the adverse effects of the disease on their physical health, shift patients from focusing on the disease to focusing on themselves, and promote more positive changes in personal cognition and behavior, such as regular medication behavior, strict monitoring of blood sugar changes and strengthening outpatient follow-up. Diabetes is a kind of traumatic event. After discovering the benefits of
the traumatic event, patients can truly feel their self-worth and the meaning of life, take the initiative to fight the disease in a positive way, and influence the people around them with their own actions, such as telling their relatives to strengthen preventive health care, pay attention to diet and exercise, and use practical actions to fight the “invisible killer” of diabetes. Thus, social public health resources are saved to a certain extent.

**Influencing factors of benefit finding**

**Individual Factors**
1. Education level: the higher the level of education, the more perceived benefits are found [42, 43]. However, some scholars have found that the level of education has nothing to do with the level of benefit discovery [44], and the reason may be related to the age of the included subjects.
2. Religion: Hussein et al. conducted qualitative interviews with 15 patients with diabetes and found that religious culture helped patients find benefits in the disease [45].
3. Economic status: Patients with better economic level who pay medical expenses by medical insurance have a higher level of benefit discovery [46–48].
4. Psychological state: Multiple studies have confirmed that optimism can affect the level of benefit discovery [47, 49, 50], make it easier to accept the pain caused by diabetes, and perceive benefits in the occurrence and development of the disease. In addition, self-disclosure has a positive effect on the discovery of benefits, which may be related to revealing inner feelings to others, discovering real needs, and promoting self-cognition [42], which is consistent with the results of Stanton et al. [51]. Liang Xiaomei et al. reported that psychological resilience positively affected benefit discovery [28], while disease perception was negatively correlated with benefit discovery [43]. Coping style: Individual coping style affects the level of benefit discovery [43, 47, 52]. Active coping strategies can help people with diabetes recognize the benefits of the disease and regularly incorporate diabetes management into their life goals.
5. Age and gender are important factors affecting the benefit discovery of patients with diabetes [43, 44, 47], but other studies have shown that age and gender are unrelated to the benefit discovery level of patients [42, 53, 54], which requires scholars to expand the sample size and increase such studies in the future to further determine the impact of age and gender on the benefit discovery level of patients with diabetes.

**Disease-related factors**

Wang Danyang et al. [29] investigated 213 patients diagnosed with type 2 diabetes and found that with the prolongation of the disease course, the benefits of the patients from the disease became less and less. Other studies have pointed out that the level of benefit discovery is higher in patients without diabetes complications, the appearance of diabetes complications may mean that the disease is aggravated, and patients are prone to psychological frustration, and the benefit is lower [42, 43, 55]. This suggests that medical staff should pay attention to the implementation of personalized health education for patients with diabetes, enhance patients’ cognition of the disease, and teach patients to identify and manage complications.

**Social supporting factors**

Sang Ming et al. assessed 257 diabetic patients with perceptive social support scale and found that social support had a positive effect on benefit discovery [42], and other scholars’ studies [56, 57] also verified this result. Some studies have pointed out that family closeness and fitness can directly predict benefit discovery, and can also indirectly predict benefit discovery through mental toughness [31, 44], which suggests that families should provide more support to patients with diabetes, improve their mental toughness, and enable them to make better use of social resources, so as to obtain more benefit discovery. In addition to human support, the Internet has become another important source of social support. Valli et al.’s study [58] showed that young people with diabetes use electronic device reminders to complete diabetes care tasks and access information through online forums to better perceive benefits from the disease experience.

**Interventions found to benefit patients with diabetes**

**Health coaching techniques**

Health coaching technology is an intervention technology that emphasizes physical and mental empowerment. It advocates patient-centered and goal-oriented, urging patients to establish and complete health goals and actively change bad lifestyles, in order to improve self-management ability and quality of life, including face-to-face instruction, telephone, Internet and other forms [59–61]. Wolver et al. [62] applied this method to diabetic patients for the first time. The study subjects were randomly divided into the intervention group and the control group, the control group received routine care, and the intervention group patients were paired one-on-one with the coach for 14 30-minute telephone guidance for a period of 6 months to guide patients to find problems and set realistic goals. The results showed that the health coaching technique significantly improved the negative emotions of diabetic patients, enhanced the level of benefit discovery and subjective well-being. The randomized controlled trial designed by Wu Juan et al. [63] further verified the promoting effect of health coaching intervention on the benefit discovery of diabetic patients. In this study, there were a total of 63 patients. The control group received routine care, while the intervention group implemented health coaching technology on the basis of routine care. After 6 months of intervention, the fasting blood glucose and glycosylated hemoglobin of the patients were both reduced, and the self-management ability was improved, which was consistent with the research results of scholar Timm [64]. To prove that the treatment can have a positive psychological effect on diabetic patients and discover the benefits of life.

**Writing expression intervention**

Written expression refers to a kind of psychotherapy in which individuals disclose and express their feelings and thoughts related to important experiences or positive events through writing, so as to promote physical and mental health [65–67]. Liu Xiaoning [68] adopted a randomized controlled trial in which the intervention group used written expression and the control group was given routine care. The results showed that written expression could reduce the anxiety and depression of diabetic patients, improve treatment compliance, and promote the physical and mental health of diabetic patients. Zhu Yanzhen et al. [69] randomly divided 82 patients into two groups. Before intervention, both groups of patients participated in diabetes health education lectures organized by community organizations. The intervention group underwent writing expression for four weeks, while the control group did not. Joanna et al. [70] designed a randomized controlled trial in which the intervention group recorded positive thoughts and feelings about their illness experience on the “health website” every day, while the control group only objectively recorded daily events without paying attention to their own emotions and opinions. The results showed that the intervention group was more active in daily management behaviors and significantly reduced diabetes-related pain.

**Mindfulness therapy**

Mindfulness therapy is a systematic meditation therapy that uses mindfulness techniques to help patients relieve stress, improve cognition, and promote physical and mental health [71, 72]. Studies have shown that mindfulness therapy can reduce the psychological pain of diabetic patients, improve treatment compliance, and improve the quality of life of diabetic patients [73, 74]. In view of this, medical staff can organize diabetes patients to carry out mindfulness therapy according to department resources in a targeted manner, encourage patients’ positive behaviors, stimulate their inherent potential, and enable patients to form a correct disease view, thus improving the sense of benefit from the disease.

**Summaries**
The positive role of benefit discovery in diabetic patients has begun to appear, and the overall benefit discovery in diabetic patients is at a moderate level. At present, there is still not deep enough research on benefit discovery in diabetic patients at home and abroad. Therefore, in future studies, it is necessary to explore more deeply the factors that affect the level of benefit discovery in diabetic patients. Based on the practice, the evaluation tools for the benefit of diabetes patients were developed, and more rigorous and meaningful intervention programs were developed to promote the physical and mental rehabilitation of diabetes patients and improve the quality of life.

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