**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ**

**Західноукраїнський національний університет**

**Соціально-гуманітарний факультет**

**Кафедра психології та соціальної роботи**

**ФЕН Бо/Feng Bo**

**Психологічні важелі конструктивної зміни ставлення онкохворого до власної хвороби/Psychological levers of constructive change of the attitude of a cancer patient to his own disease**

спеціальність: 053 – Психологія

освітньо-професійна програма – Психологія

Кваліфікаційна робота

 Виконав студент групи

 ПСма-21

 ФЕН Бо/ **Feng Bo**

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Науковий керівник:

 к.психол.н., С.М. Могиляста

Кваліфікаційну роботу

Допущено до захисту

«\_\_\_» \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 20\_\_ р.

Завідувач кафедри

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **А.Н. Гірняк**

**ТЕРНОПІЛЬ-2023**

**CONTENTS**

**INTRODUCTION**.......................................................................................................2

**CHAPTER 1: THEORETICAL REVIEW AND RESEARCH REVIEW**............6

1.1. Theory and related research on psychological leverage.................................6

1.2. Theory and related research on quality of life..............................................20

1.3. Stress Interaction Theory and Related Research..........................................23

**CHAPTER 2: RSEARCH IDEAS, METHODS, AND RESULTS**.......................31

2.1. Research idea and hypothesis.......................................................................31

2.2. Technical route of research..........................................................................33

2.3. Research tools and methods.........................................................................35

2.4. Statistical methods.......................................................................................40

2.5. Research result.............................................................................................41

2.6. Descriptive analysis of psychological levers, cognitive assessments, coping styles, and quality of life.....................................................................................46

2.7. Analysis of the relationship between psychological leverage, cognitive evaluation, coping and quality of life..................................................................49

2.8. Analysis of demographic variables..............................................................71

**CHAPTER 3: CONCLUSION**.................................................................................83

**SUMMARY**...............................................................................................................85

**REFERENCE**............................................................................................................88

Appendix 1 Descriptive Analysis Table for Demographic Variables.................95

Appendix 2 Questionnaire for the study............................................................101

**INTRODUCTION**

Stressful events are an inevitable part of human life, and how individuals cope with these events can greatly impact their mental health. Personality is a key factor that determines an individual's ability to deal with stressful situations, and the concept of psychological leverage has been proposed to explain why some people cope successfully with. However, most of the research of psychological leverage has focused on childhood, and there is limited research on adult psychological leverage, especially in the context of major stressful events such as cancer.

Cancer is a serious disease that poses a significant threat to human life, and its incidence is increasing globally. Improving the quality of life of cancer patient is a major concern in the medical community, as can help evaluate the effectiveness of cancer treatment and understand the psychological state of cancer patients. Personality factors, cognitive evaluation, and coping styles are among the many factors that affect the quality of cancer patients life.

The aim of this research is to explore the psychological mechanisms of psychological leverage in the context of cancer and to understand how cancer patients regulate their psychological leverage. Specifically, this research seeks to understand the characteristics of cognitive evaluation and coping styles in cancer patients and their impact on life quality. By doing so, this research will provide a theoretical and practical basis for cancer patient rehabilitation and psychological intervention.

**Research Goals:**

The primary objective of this research is to explore the psychological mechanism of psychological leverage under cancer stress events and to understand the characteristics of cognitive assessment and coping styles of cancer patients and their impact on quality of life. The specific scientific problems that will be addressed in this study include:

1. Exploring the psychological mechanism of psychological leverage in the context of cancer stress events.

2. Examining the relationship between cognitive evaluation and quality of life in cancer patients.

3. Investigating the impact of psychological leverage, cognitive assessment, and coping styles on the quality of life of cancer patients.

4. Assessing the influence of demographic variables on psychological leverage.

5. Evaluating the positive and uncertain aspects of psychological leverage in the context of cancer.

**Methodology:**

To achieve the research goals, theoretical methods such as analysis, synthesis, comparison, analogy, induction, deduction, ranking, systematization, and generalization will be used. Additionally, data will be collected through interviews and questionnaires to examine the psychological mechanism of psychological leverage in cancer patients.

**Theoretical Significance:**

Theoretical significance of this research lies on its contribution to understanding the mechanism of psychological leverage, which can help predict how individuals react after facing a stressful event. Additionally, the research can provide insight into the cognitive evaluation and coping styles of cancer patients, which can help build a more unified model for the study of psychological leverage.

**Practical Significance:**

The practical significance of this research is that it can provide a theoretical and practical basis for cancer patient rehabilitation and psychological intervention. The research results can be used by doctors, nurses, relatives, and friends to better understand the psychology of cancer patients and provide targeted guidance and help for personality characteristics and psychological status.

**Scientific Novelty:**

The scientific novelty of this research lies in its focus on understanding the impact of psychological leverage on the quality of life of cancer patients, which is a special disease group. The research can provide valuable information for cancer patients and supply a certain basis for medical and psychological intervention. Additionally, the study of cognitive evaluation and coping styles of individuals with psychological leverage can help build a more unified model for the study of psychological leverage.

**Conclusion:**

Overall, this research aims to explore the psychological mechanisms of psychological leverage in the context of cancer and understand how cancer patients regulate their psychological leverage. The results of this research can provide valuable information for cancer patient rehabilitation and psychological intervention and contribute to the study of psychological leverage.

**Thestructureofthemaster'sthesis**consists of an introduction, 3chapters, a general conclusion, a summary that includes the full text and a list of used sources with 66titles. The total pages of work are 105. Themainpartcontains57tables and figures.

### CHAPTER 1

### THEORETICAL REVIEW AND RESEARCH REVIEW

## 1.1 Theory and related research on psychological leverage

### 1.1.1 The research history of psychological leverage

The study of psychological leverage began in the 1970s, when child psychologists found that many children who were in adversity (sick parents, broken families, poor economic conditions, etc.) were not as knocked down by adversity as one might expect, but instead developed into a confident, resilient child. Capable, caring people [62]. Forty years ago, Norman Garmezy found that children of mentally ill parents could adapt to life well and proposed that psychological levers may play a great role in the field of human mental health [9]. For example: poverty, domestic violence, chronic diseases, catastrophic life events, etc. These studies mainly focus on individual protective factors, because these protective factors can make some children adapt positively to negative life events [39].

At first, people mainly studied the personal characteristics of children with psychological leverage, such as autonomy and self-efficacy. Later, people found that psychological leverage also comes from external factors of children, and proposed three major factors that lead to psychological leverage: individual factors and family factors. and social environmental factors. In the past 20 years, empirical work has shifted from identifying protective factors to the protective mechanisms behind, no longer simply studying individual, family and social environmental factors, but more understanding of why these factors lead to positive adaptive outcomes, research Mechanisms are very important by psychologists, and they can design reasonable intervention strategies based on these mechanisms.

### 1.1.2 Conceptual understanding of psychological leverage

There is no unified understanding of the concept of psychological leverage in academic circles, including no unified standard in terms of Resilience and Resiliency. With the development of psychological leverage research, the concept of psychological leverage is constantly changing.

Early research regards psychological leverage as a result or phenomenon and believes that psychological leverage is the result of individual adaptation and development in the face of serious threats. But as research has progressed, this definition has been challenged, not only because research has shown that psychological leverage is not a transient state or phenomenon, but a long-term stable trait, but also because there is no strict standard for this definition of psychological leverage, there is also no way to measure it, making it difficult to compare the results of individual studies [45].

With the progress of research, most scholars regard psychological leverage as a personality trait or ability. They believe that psychological leverage is a characteristic had by individuals. Previously, this characteristic was thought to be possessed by a small number of super normal children, but now more research believe that psychological leverage is a general human trait [19]. The psychological lever here not only means that the individual can recover to the original state after major trauma or stress and can be tenacious and persistent under the threat of stress, but also emphasizes that the individual can grow and regenerate after setbacks. Jeanne and Block proposed the self- psychological lever, and regarded the psychological lever as the ability to effectively cope and adapt in the face of loss, difficulty or adversity [58]. Stewart defines psychological leverage as an individual's ability to successfully cope with major changes, misfortunes or dangers, which can change and can be enhanced by protective factors in the individual and the environment [55]. American scholar Luthansdefines psychological leverage as the psychological ability of people to quickly recover from adversity, conflict, failure, and responsibility pressure, which has important guiding significance for improving personal ability and social human capital [40]. Wangi and Young defined a psychological lever as a personality capable of regulating negative stressful events [60].Lengnick Hall believes that psychological leverage is an ability to see a crisis as a challenge, not just a rebound, but a greater growth [53].

Contrary to the understanding that psychological leverage is a kind of personality, some scholars understand psychological leverage as a dynamic development and change process. Rutter defines the psychological lever as the process of adjusting the influence of risk factors and successfully adapting, emphasizing the interaction of risk factors and protective factors [51].Flach believes that psychological leverage is a process that can increase ability through learning [17]. The American Psychological Association defines psychological leverage as an individual's well-adjusted process in the face of life adversity, trauma, tragedy, threat or other major life stress [28]. Lutharbelieves that psychological leverage is a dynamic process, a process in which a series of abilities and characteristics interact dynamically to enable individuals to quickly recover and successfully cope with major stress and danger.

### 1.1.3 Two main aspects of psychological leverage research

**1.1.3.1 Trait research on psychological levers**

Psychological leverage as a human trait has focused on children and adults. Research on children's psychological leverage mainly focuses on poverty, parental divorce, parental illness, parental drug use, separation from parents and so on. Researchers have actively explored how to increase children's psychological leverage. Garmezyregards the psychological leverage as an individual's inherent trait to study and proposes that the improvement of psychological leverage depends on the protection factors of the individual, family and society. Individual factors include vitality, high cognitive skills, cheerful outlook towards others. responsiveness, persistence, and self-dependence; family factors include a good family environment, a warm family atmosphere, consistent family members behavioral norms, and the care and support that individuals receive in the family; social factors include close peer friendships in social activities, A good role model, a harmonious interpersonal relationship, a relaxed work and activity environment, etc., are all crucial for maintaining psychological leverage. However, there are also studies that over-protective parents can cause them to grow up with low psychological leverage [22]. Wo Lin believes that keeping a good relationship between children and adults can increase children's psychological leverage [15].

Masten's research on children's psychological leverage shows that psychological leverage is not a transient phenomenon but a basic psychological ability, derived from the human adaptive system, and manifested in three main phenomena: 1) high psychological leverage The child showed better results than expected. 2) Maintain positive adaptation despite stressful events. 3) The psychology can recover quickly after being traumatized [43].

Beardslee research found that individuals with high psychological leverage have abundant energy and excellent work and academic performance, and they can think independently [6].Hechtmanfound many positive characteristics of children with psychological leverage such as initiative, sociability, adaptability, high IQ and self-esteem [26]. Block research found that individuals with psychological levers are optimistic, eager, full of strength in life, curious about new things and have positive emotions [7].

on adult psychological levers mainly focuses on people's responses to illnesses and major emergencies, such as cancer, AIDS, and 9/11. Rabkin's research found that long-term survivors of AIDS have different general individual resources: superior intelligence, high education level, self-confidence, broad interests, abundant external resources, the ability to adapt to changes, optimism and clear their goals [32]. Antony's research found that the recovery of cancer patients is related to personal characteristics and processing methods [3]. Fredrickson's research found that after 9/11, individuals with high psychological leverage were more able to adapt to later life and were more likely to take a positive evaluation of the event [19]. Rickwoodpointed out that individuals with high psychological leverage can live a good life even in the face of difficult environments and enormous pressure [22]. Many studies have found that individuals with high psychological leverage have more positive emotions, good planning ability, and a sense of responsibility., helpfulness, strong belief, creativity and perseverance in the face of difficulties.

**1.1.3.2 Process Research on Psychological Leverage**

Some scholars believe that psychological leverage is an individual's recovery process in the face of stressful events, and based on this understanding, a series of models have been proposed. Fine [16] believes that an individual's feeling and response to stressful events are important factors in survival, recovery, and recovery. He considers psychological levers to be two processes: the first is the acute process, where energy is gathered to reduce the effects of stress, and the second is the restructuring phase, confronting reality and accepting it. But these views have not been further confirmed. Flach further proposed that the psychological lever process is the process of destruction and reconstruction [17].

Based on Flach's research, Richardson proposed a process model (Figure1-1), arguing that the development of psychological levers is a process from disintegration to reintegration, in which individuals develop psychological through conscious and unconscious choices. lever [24]. This model believes that the individual is in a state of equilibrium. When faced with external stimuli, the body's protective factors will resist the external stimuli to maintain the balance. These protective factors include external environmental factors and the individual's own factors. When resistance is ineffective, the balance is disrupted, and the individual consciously or unconsciously begins to reintegrate, which can lead to four possible outcomes:

1) Reaching a higher level of equilibrium, that is, enhancing the individual's psychological leverage. Children who experienced and overcame difficulties as children grow up more and have more psychological leverage than those whose growth stages were smooth sailing.

2) Return to the first equilibrium state.

3) A lower level of balance is set up with the loss, when the individual must give up the original drive, hope or motivation in life.

4) A state of imbalance that goes with dysfunction in which individuals turn to substance abuse, destructive behavior, or other unhealthy ways to cope with life stress. The value of this model is that it reminds people that psychological leverage is a result of conscious choice, which is different from recovery in the ordinary sense.



Figure 1-1 Process Model of Psychological Leverage

Rutter proposed an interaction model between protective factors and risk factors [25]. Protective factors may not be easy to detect, but they are beneficial for later development. These factors include personal characteristics such as gender, age, and experience. The process of psychological lever formation includes the interaction of risk factors and protective factors, and the interaction between individual internal and external, to change the utility of bad life events. Rutter believes that psychological leverage is not just about adapting to stress, but more about recovering from negative events. Rutter's research is the most widely cited in this area.

Hunter proposed the hierarchical theory of psychological leverage [29]. He believes that the psychological lever at the lowest level has only survival meaning, people protect themselves through violent aggression and emotional repression; the psychological lever at the middle level has defensive meaning, the individual refuses to communicate with others, so as to resist the bad stimuli of external life; the highest level Only the psychological lever at the level has the meaning of health and growth. They actively mobilize personal resources, obtain more social support, and flexibly deal with life pressure. People in the first two levels often experience psycho social adaptation and even psychological barriers after adulthood.

Mandelc andbased on summarizing previous studies, Peery proposed a model of children's psychological lever system [27]. Internal factors are biological factors and psychological factors. Specifically, biological factors include physical health, genetic quality, temperament, and gender, etc.; psychological factors include intelligence, cognitive style, critical thinking skills, and personality characteristics. External factors refer to family factors and social factors. Several factors influence each other. Not only internal factors and external factors influence each other, but also internal factors and external factors interact. Although the internal factors and external factors are equal in size, when the internal factors are missing or reduced, if the external factors can be compensated in time, a good psychological adaptation can also be achieved, thus showing psychological leverage. For example, although a child's intelligence and critical thinking skills are not excellent, he may also have high psychological leverage if his parents and grandparents can provide him with support and care.

### 1.1.4 Research methods and measurement of psychological leverage

Study psychological levers are mainly person-centered, and event centered. The human-centered approach used multiple scales to divide the observed subjects into high and low psychological leverage groups, and compared the responses of the two groups to stressful events to decide which factors could lead to psychologically leveraged individuals successfully coping with stressful events. The event-centered approach refers to seeing people's reactions when something happens, classifying successful respondents into a high- leverage group, and those who don't respond well into a low- leverage group, to further study what they used at that time. Strategy. Measuring psychological leverage is of great interest, in the clinical realm, to illustrate which factors are beneficial for keeping patient health; in predicting tolerance for stressful and negative events, it can be used to select individuals who can successfully cope with difficult job demands people. Regarding the measurement of psychological leverage, scales are now mostly used, and the main measurement scales are:

1) Block and Kremen's scale, referred to as ER89 [7], was developed from adult samples. This scale has a wide range of uses and relatively simple questions. There are 14 items on a 4-point scale. The higher the score, the more meaningful it is. The more energy the person has, the more quickly they can recover from stressful events. Luthans has used this scale to measure the psychological leverage level of Chinese workers [31].

2) Wagnild and Young's scale has 25 items and is a 7-point scale, ranging from 1 for "strongly disagree" to 7 for "strongly agree", with scores ranging from 25 to 175, mainly including two aspects. Factors: one is the ability of the individual, the other is the acceptance of self and life.

3) Connor and Davidson's scale (CD- RISC for short) [10], this scale is also developed from a rich adult sample, CD- RISC can be used to measure the development level of psychological leverage, mainly used to measure The patient's recovery after treatment.

### 1.1.5 Research on factors related to psychological leverage.

**1.1.5.1 Research on psychological leverage and statistical variables**

A L- NaserF was measured with the ER 89 scale, and it was found that men scored higher than women, children from extended families scored higher than nuclear families, and students from the science department scored higher than the arts department [27]. Werner: pointed out that the improvement of psychological leverage in boys and girls depends on different social support, the development of psychological leverage in boys mainly comes from the help of fathers or male relatives, and the development of psychological leverage in girls mainly comes from the help of mothers or female relatives [29].

Additionally, previous research has shown that there are other factors that may influence psychological leverage. For example, studies have suggested that individual personality traits, such as optimism and resilience, may play a role in the development of psychological leverage. Moreover, social support and the quality of interpersonal relationships have also been found to be important factors that contribute to the development of psychological leverage.

It is also worth noting that the measurement of psychological leverage is a complex and multifaceted process, and that different instruments may be used to assess different aspects of psychological leverage. For example, the ER 89 scale used in the study by A L- Naser F focuses on resilience and coping strategies, whereas other scales may assess related constructs such as hope, optimism, and self-efficacy.

Given the complexity of the construct of psychological leverage, it is important for future research to continue exploring the various factors that contribute to its development and maintenance, as well as the different methods and instruments used to measure it. By doing so, we can gain a more comprehensive understanding of psychological leverage and its role in promoting positive outcomes across different domains of life.

**1.1.5.2 Research on the relationship between psychological leverage and emotion**

Fredrickson believes that psychological leverage is related to finding the positive meaning of current stressful events, proper state of mind and positive emotions. Through the reactions of people after the 9/11 incident, he found that psychological leverage was significantly positively correlated with curiosity, happiness, expectation, and satisfaction in positive emotions, and negatively correlated with anger and irritability in negative emotions. Psychological leverage individuals reduce the stress of facing 911 events through emotional regulation, thereby relieving symptoms. Individuals with high psychological leverage use humor (Wener), relaxation techniques (Wolin), and optimistic thoughts

(Kumpfer) to cultivate their positive emotions. Michele's research found that psychological leverage traits are related to positive emotions such as happiness and desire [6].

**1.1.5.3 Research on Psychological Lever and the Big Five Personalities**

Furnham found that psychological leverage was negatively correlated with neuroticism (r=-0.71) [21]. Larsen's study found that neuroticism, extraversion, openness and psychological leverage are positively correlated [31], and some studies have found that psychological leverage has a high positive correlation with conscientiousness and extroversion in the Big Five, and a high negative correlation with neuroticism. There was a small negative correlation with openness and no correlation with agreeableness.

These findings suggest that there may be complex and nuanced relationships between psychological leverage and personality traits, which may vary depending on the specific traits and measurement instruments used. For example, while Furnham's study found a negative correlation between psychological leverage and neuroticism, Larsen's study found a positive correlation between the two constructs. Additionally, other studies have reported positive associations between psychological leverage and extraversion, conscientiousness, and other aspects of the Big Five personality traits.

It is worth noting, however, that the direction and strength of these correlations may also depend on contextual factors such as cultural background and life circumstances. For example, a study conducted in a collectivistic culture found that psychological leverage was positively correlated with agreeableness and negatively correlated with extraversion, while in an individualistic culture, the opposite pattern was observed.

Taken together, these findings highlight the importance of considering the complex interplay between personality traits and psychological leverage, as well as the potential influence of cultural and contextual factors. Future research may benefit from adopting a more nuanced and comprehensive approach to exploring these relationships, in order to gain a deeper understanding of the underlying mechanisms and implications for promoting positive outcomes across different populations.

**1.1.5.4 Research on the impact of psychological leverage on quality of life and health**

Fredrickson's study found that there is a positive correlation between psychological leverage and life satisfaction [19]. Resnick believes that psychological leverage is a protective factor against health threats [32]. Haase's ARM (AdoleseentResilenee Model) model pointed out that psychological leverage has an impact on quality of life [23].

These findings suggest that psychological leverage may play an important role in promoting positive outcomes across various domains of life. For example, Fredrickson's study found a positive correlation between psychological leverage and life satisfaction, suggesting that individuals with higher levels of psychological leverage may be more likely to experience greater levels of well-being and satisfaction with their lives [19].

Similarly, Resnick's study found that psychological leverage can serve as a protective factor against health threats, highlighting the potential health benefits of cultivating psychological leverage [32]. Haase's ARM model also emphasizes the importance of psychological leverage in promoting a positive quality of life, particularly during adolescence, when individuals are often faced with unique challenges and stressors [23].

Taken together, these findings underscore the potential value of promoting psychological leverage as a means of enhancing well-being and resilience across different populations and contexts. Further research is needed to explore the mechanisms through which psychological leverage may impact various outcomes, as well as the most effective strategies for fostering psychological leverage in different populations. Nonetheless, the evidence to date suggests that cultivating psychological leverage may be a promising avenue for promoting positive outcomes across a range of domains, from health and well-being to academic and occupational success.

**1.1.5.5 Research on psychological leverage and stress**

In terms of stress cognition, Thgade's research found that individuals with psychological leverage do not regard external negative events as threats but evaluate them as challenges. In terms of negative stress coping strategies, avoidance, blaming others, and unrealistic expectations aren’t considered to be beneficial for psychological leverage [34]. Kauai's longitudinal study found that children with psychological leverage tend to use problem-focused solutions [29]. Aiehart-Treichel pointed out that individuals with high psychological leverage tend to respond positively to stress [4].

## 1.2 Theory and related research on quality of life

### 1.2.1 Definition and measurement of quality of life

The study of quality of life (QOL) originated in the United States in the 1930s, when it used as a sociological indicator, and was gradually introduced into the field of medicine. With the transformation of the modern medical model from the simple biomedical model to the biological, psychological and social medical model, people not only pay attention to physical health, but also pay more attention to the complete physiological, psychological state and social adaptability, that is, the improvement of the quality of life. So far, the definition of quality of life still lacks theoretical unity. Oricy believes that the quality of life is the objective state and subjective feeling of the individual's physical, psychological, social functions and material living conditions [39].

WHO puts quality of life?

Defined as individuals in different cultures and value systems about their life goals and expectations, as well as their concerns about life status experiences.

Over the years, foreign experts in clinical medicine and health service research have measured quality of life from different perspectives. At present, according to the different objects of use, the scales are divided into three categories, namely the universal scale (generic scale).scale), disease-specific scales (disease - specificscale) and domain scales (domain - specificscale). The universal scale is used to measure the quality of life of the general population (with or without the disease), and the disease-specific scale is a special tool for a specific population (patients with a certain disease and some special populations). Commonly used scales for patients with cancer (QLQ - 30), life function index for patients with cancer (FLIC), scale for patients with chronic diseases such as diabetes mellitus (DCCT), scale for patients with chronic obstructive pulmonary disease (COPD), mental illness Scale (BASIS- 32) and so on. Domain-specific scales, which focus on measuring a certain area of quality of life, commonly used activities of daily living (ADL) scales that focus on the treatment of disease symptoms, and side effects assessment (RCSL) scales, which focus on behavioral performance Functional Assessment (KPS) scale, etc.

The measurement of quality of life is a comprehensive measurement of the physical, psychological and social aspects of a good life adaptation state felt by an individual or group [37]. From the definition and measurement of quality of life, it can be found that quality of life has the following characteristics:

1) The quality of life is a comprehensive indicator, which has many aspects, that is, a multi-dimensional data.

2) Quality of life is often described in functional or behavioral terms, that is, it should focus on the behavioral ability of a person with a certain state, rather than clinical diagnosis and laboratory test results.

3) In terms of evaluators, more self-evaluation is used, that is, the teste evaluates his own life quality, which also emphasizes respecting the testis psychological reaction and not ignoring the influence of the social environment on it.

4) The indicators that reflect the quality of life are often subjective indicators. When evaluating the quality of life, there is no universal aim reference standard, and it is also affected by a person's experience, beliefs, expectations and perceptions.

5) The quality of life is time-varying, that is, it changes with time.

### 1.2.2 Research status of quality of life

At present, the global scientific observation of quality of life is used for the efficacy evaluation of clinical trials and the health evaluation of patients with a specific disease. Such as the evaluation of the quality of life of cancer patients, the quality of life of mentally ill patients, the quality of life of the elderly, etc., while the research on the quality of life of the general population is rarely reported at home and abroad. The research work on quality of life in China began in the mid-1980s. The sociological field has carried out a lot of work, and the medical field has carried out more research on the quality-of-life survey and its evaluation indicators, mostly targeting special populations, such as the elderly, cancer patients and mentally ill patients, but China has not yet formed a complete evaluation system.

### 1.2.3 Application of quality of life

Since quality of life can measure various important aspects of an individual, researchers have widely used it in clinical trials, health policy formulation, and evaluation of health resource benefits, involving cancer, cardiovascular and cerebrovascular diseases, geriatric diseases and other chronic diseases. The evaluation of health status of population and patients, the evaluation and selection of clinical treatment plan, the evaluation of preventive intervention and health care measures, and affect the decision-making of health resource allocation and use.

## 1.3 Stress Interaction Theory and Related Research

### 1.3.1 Stress Interaction Theory

The research field of stress is overly broad, and there are countless theories about stress. At present, the most influential theory in the field of stress research is the stress interaction theory (transaction) proposed by American psychologist Richard S. Lazarus in 1966, and the stress interaction model established subsequently [30]. Lazarusbelieves that most external stimuli cannot be absolutely defined as stressful events, the individual 's cognitive evaluation decides whether an event is a stressful event, the same environmental event may make him feel stressful to a certain person, and the same environmental event may cause him to feel stressful. Maybe not for others. He defines stress as a mismatch between needs and coping sources, and he believes that in the interaction between people and the environment, two processes are important: evaluation and coping. Evaluation refers to strictly assigning a value to something or judging the properties of something, and coping refers to the use of behavioral or cognitive methods to deal with environmental and internal needs and conflicts between the two.

Lazarus believes that people generally evaluate events that occur in three ways: harm, threat or challenge. Injury refers to losses that have already occurred; threats refer to losses that have not yet occurred but are expected to occur in the future; and challenges refer to a demanding situation in which an individual emphasizes mastering the requirements and overcoming them. Difficulty and allow the individual to grow and develop. Most people like challenges, not threats. Having a challenging attitude can make people feel enthusiastic, engaged, and developed, rather than feeling dangerous and defensive and in need of self-preservation. Frieze believes that there are three strategies for cognitive evaluation of stressful events: one is to deny the stressful event, the other is to redefine the stressful event, and the third is to deny one's own ability and value [20]. Through the first strategy, people deny the information inconsistent with their wishes, so that they can restore their previous beliefs; through the second strategy, people try to reconstruct the content of the event, so that the original beliefs can be maintained; the third strategy refers to Under pressure, people completely deny their original beliefs, abilities and values, so that they give up their original beliefs. In terms of the individual's own meaning, the first two strategies are positive, and the latter is negative. Individuals choose different cognitive evaluation strategies will lead to different psychophysiological responses.

Research on stress coping is also very extensive. Lazarus and Folkmanpointed out that there are two types of coping: problem-oriented coping (problem - Focused) and emotion-oriented coping (emotion - Focused). Problem-oriented coping is to solve problems by changing the situation, and emotion-oriented coping is to relieve stress by regulating emotions. Endler and Parker also proposed three coping styles, including task orientation, emotion orientation and avoidance orientation [22]. Ferguson and Cox pointed out that stress coping can be roughly divided into four main categories, namely emotion regulation, approaching, reassessment, and avoidance coping. Avoidance coping is to relieve stress by leaving the stressful situation [15]. Terry and Hynes classified coping strategies into four types from the two functional dimensions of problem - emotion: problem evaluation, problem management, avoidance and emotion regulation [46]. To sum up, the research on stress cognition and stress coping does not have a unified conclusion. Researchers mostly classify the two according to their own theoretical framework and research needs, and the most important basis comes from Lazarus 's theory.

### 1.3.2 Research on stress interaction theory in the field of cancer

**1.3.2.1 Research on cognitive evaluation of cancer patients**

Cancer, as a major stress event, has an important impact on people's body and mind. Many scholars have studied how cancer patients evaluate and cope with such major stress events based on Lazarus' theory. The study of Hamama- Raz et al found that the subjective cognitive evaluation of patients with melanoma is related to their psychological adjustment. High cognitive evaluations, such as seeing illness as a challenge, helped them keep a good mental state and reduce depression. This also shows that subjective factors play a key role in the treatment of disease [25]. Ahmad et al. investigated the relationship between cognitive evaluation and coping style of 131 prostate cancer patients and their living conditions. The study found that the more patients evaluated the condition as loss and threat, the worse their physical and psychological state, and the more Emotion-oriented coping; if they think the diagnosis of the disease is a challenge to themselves, then they mostly use problem-oriented coping, but whether they take problem-oriented coping or emotional-oriented coping cannot predict their future health status [1] , and Barton However, the study by et al found that patients who rated the disease as a threat would have poor health outcomes [19] . Burgess et al. found that cognitive evaluations and coping styles are related to emotion, cognitive evaluations of loss or feeling blamed may cause anger, threatening evaluations or emotionally oriented coping may cause anxiety, loss evaluations or low problem-oriented coping may cause Sadness and depression [8]. Sheila and Payne surveyed breast and ovarian cancer patients hospitalized or at home and found that cancer patients adopt different conditions and responses such as positive thinking, surrender, fear and disappointment, and positive thinking and accepting facts are the most important Reaction[5l], these women can correctly accept the reality of cancer due to their positive understanding, and also realize that cancer requires long-term treatment, and even has the risk of recurrence. Coulter et al.'s study of lung cancer patients found that fear and uncertainty were the most common evaluations of cancer patients [17].

The cognitive evaluation of cancer is also affected by the country. Studies of breast cancer patients in different countries have found that the cognitive evaluation of breast cancer patients on cancer is hugely different. Women in Ireland mostly evaluate the disease as a threat and challenge. While Italian women rated breast cancer as a challenge and loss. Women in Hungary rated cancer as a loss, a threat, and a challenge. Women in the United States and Canada view cancer as a challenge to themselves. In a study of Thai breast cancer patients, Saneha et al. found that problem-oriented coping has little to do with the psychological state of cancer patients. The time of diagnosis and the evaluation of disease threat affect the psychological state of patients, further verifying that cognitive evaluation plays a very important role [52].

**1.3.2.2 Research on coping styles of cancer patients**

Cancer patients have many ways to cope with the disease, and researchers have conducted many investigations in this area. Fredette[29] , in a survey of breast cancer patients who survived for more than 5 years, found that most of the patients adopted the strategy of "coping with changing the stress event itself as the main body" to relieve psychological pressure, such as working hard, mentally coping, seeking information and Seek help from family members and friends, and adopt positive coping strategies instead of negative coping strategies "to relieve emotional changes caused by stress". Judy et al [33] used the method of questionnaire survey to investigate the coping of 244 breast cancer patients from 6 aspects and found that breast cancer patients mainly responded to stress in the way of "changing the coping of the event itself”, seeking information is the most widely used coping method. Carver [11] also reported that breast cancer patients adopt different coping strategies to relieve stress, including accepting reality and coping positively, among which religious belief is the most popular coping strategy. Misheletal[44] proposed in their survey of gynecological cancer patients under treatment that fantasy coping strategies were the most popular; on the contrary, negative coping strategies, such as denial and avoidance, were used the least. Misheletal [24] applied the modified JCS to measure the coping of cancer patients who survived for more than 5 years and proposed that optimistic coping styles were used the most, followed by support, bravery, and self-reliance; the least used was avoidance coping styles. The second is emotional coping. The research also shows that optimistic coping style is the most effective coping style, followed by conservative and self-reliance; the most ineffective is escape, followed by resignation and emotional coping style. The results were like those of Chinese gynecological cancer patients. In the coping study of Chinese gynecological cancer patients, it was also concluded that the most often used and most effective coping style is optimistic coping style, followed by support; the least and most ineffective is emotional coping style, followed by escape [61]. Ali et al [9] applied MCEQ to the coping study of 64 breast cancer patients and proposed that seeking information and support is the most widely used and most effective coping style. Coulter [17] found that seeking social support is the most common coping style, while avoidance is the least used coping style. Krausele[34] applied an open-ended questionnaire method to a qualitative study of 120 cancer patients and proposed some direct behaviors, such as: seeking information and social support, facing the right way, participating in social activities or work, and seeking support and help from relatives and friends. The most often applied coping strategy. The negative coping strategies of denying and trying to forget the disease were less used in this group of cancer patients. Lev [36] also proposed that information seeking is the most used coping strategy for cancer patients, followed by self-comfort and social support.

Various stages of cancer patients respond differently. Chinese researcher Li Yanqun found [38]that the coping style of cancer patients is mostly "avoidance" in the early stage, "face" in the active treatment process, and "yield" in the late stage. Cancer patients at the early stage of diagnosis may be reluctant to accept the fact that they have cancer, so they often temporarily adopt "avoidance" coping methods to relieve their inner pressure. Although "avoidance" is not conducive to physical and mental health, it is not the most important coping method in the whole disease period. In the active treatment stage of the disease course, most patients have accepted the fact that they have cancer. At this time, patients will actively seek information related to the disease and hope to get the best treatment. Because of their desire to survive, patients will have a positive attitude and perseverance. To overcome the discomfort caused by the treatment, patients at this stage still have confidence in the recovery of the disease, so the patients begin to face reality and adopt various strategies to relieve stress. The "face-to-face" coping is generally considered to be a more positive coping style. Due to the deterioration of the disease, the patients in the advanced stage have a negative understanding of the recovery of the disease and lack confidence in the recovery. After a long time of fighting against cancer, the patients in this stage have to adopt a "succumbing" way of coping. "Surrender" coping, although a negative coping style, is beneficial to the patient's acceptance of death in the late stage of the disease.

Coping styles directly or indirectly affect the health and psychological states of cancer patients. Neises found that patients who used active cognitive and active behavioral coping strategies reported more positive emotions, higher levels of self-esteem and fewer somatic symptoms. Avoidant coping (avoidance, denial, and avoidance) is positively associated with psychological stress responses (e.g., anxiety, anger, depression, etc.) and inferior quality of life. Diane [28] studied the quality of life and coping of 40 gynecological cancer patients and their husbands and found that the total score of patients' quality of life was negatively correlated with emotional expression, fantasies, and self-blame. Coping styles were negatively correlated, and socioeconomic and psychological aspects were negatively correlated with emotion, fantasy, self-blame, and information seeking. Research by Zhu Lihua[66] shows that surrender coping in cancer patients is the most unfavorable coping style for their health or even recovery, while avoidance coping is not conducive to physical and mental health, but it is not the most obvious, and is generally considered to be more positive. Coping with nature has little to do with physical and mental health. In terms of the influencing factors of succumbing to coping, "lack of confidence" is the most important factor.

###

### CHAPTER 2

## RSEARCH IDEAS, METHODS, AND RESULTS

## 2.1 Research idea and hypothesis

As to whether psychological leverage is a trait variable or a process, there is no unified standard in previous studies, and there are not many studies on how psychological leverage affects outcome variables if it is used as a trait variable. Based on the stress interaction theory, this study considers psychological leverage as a trait variable, that is, a person's ability to successfully cope with major stressful events. The research results of many researchers have proved that there is a great correlation between psychological leverage and some personality variables, and using psychological leverage as a trait variable can make quantitative learning and comparison between various research results, so the research is of great significance.

Through earlier studies, trait variables can affect individuals' cognition and response to life events, and in some cases even determine the formation, development, and outcome of life events. This study considers that psychological leverage, as a trait variable, can affect cognitive evaluation, coping style and quality of life. According to Lazarus' theory, cognitive evaluation can affect coping style and directly affect outcome variables, so cognitive evaluation plays a mediating role between psychological leverage and quality of life, and between psychological leverage and coping style, as a mediating variable. Mediation variables can describe the degree of relationship between predictor variables and criterion variables, explain how external physical events can show their inherent psychological significance, and explain why mediation effects occur and how they are achieved. According to the concept of the research, the model shown in Figure 2-1 is obtained.



Figure 2-1. Concept of this research

Description of each variable in the model:

1) Psychological leverage: This study regards it as a trait variable, which is the psychological ability of an individual to effectively cope and adapt in the face of loss, difficulty or adversity.

2) Cognitive evaluation: refers to the individual's assessment of the nature and degree of life events met and the possible hazards from their own perspective. There are four latitudes, which are uncertainty about the results, feeling (disease) threat, (disease) responsibility and positive evaluation.

3) Coping style refers to the cognitive and behavioral measures that individuals take to life events and their own imbalanced state due to life events. There are 3 ways: face, avoid and surrender.

4) Quality of life: including comprehensive quality of life and four sub-aspects of physiology, psychology, society, and environment. Based on earlier research, this study proposes the following hypotheses:

l) Cognitive evaluation has a mediating effect between psychological leverage and coping style.

2) Coping style has a partial mediating effect between cognitive evaluation and quality of life.

3) Psychological leverage can not only affect the quality of life through cognitive evaluation and coping style, but also directly affect the quality of life.

## 2.2 Technical route of research

This research is divided into five stages: (1) Literature data collection, sorting and writing review; (2) Designing, testing, analyzing, and revising questionnaires; (3) Questionnaire survey; (4) Data processing and analysis; (5) Write a paper and draw conclusions.

These five stages represent a comprehensive approach to conducting research on psychological leverage and its relationships with various outcomes. The first stage involves a thorough review of existing literature on psychological leverage, in order to gain a comprehensive understanding of the current state of research in this area. This step is critical for identifying knowledge gaps and research questions that can be addressed through subsequent stages of the study.

The second stage involves designing and testing a questionnaire to measure psychological leverage and related constructs, such as personality traits and life satisfaction. This stage typically involves multiple rounds of testing and refinement, in order to ensure that the questionnaire is valid and reliable.

The third stage involves administering the questionnaire to a sample of participants, in order to collect data on their levels of psychological leverage and other relevant variables. This step may involve recruiting participants from diverse populations and contexts, in order to ensure that the results are generalizable to broader populations.

The fourth stage involves processing and analyzing the data collected through the questionnaire survey, in order to identify patterns and relationships between psychological leverage and other variables of interest. This stage typically involves using statistical methods to test hypotheses and generate findings that can be used to draw conclusions about the research questions.

Finally, the fifth stage involves writing up the results of the study and drawing conclusions based on the findings. This stage typically involves synthesizing the results of the previous stages and interpreting them in light of the existing literature on psychological leverage and related constructs.

Overall, this five-stage approach provides a comprehensive and rigorous framework for conducting research on psychological leverage and its relationships with various outcomes, and can serve as a useful guide for researchers interested in exploring this topic in more depth.

## 2.3 Research tools and methods

This research mainly adopts the method of questionnaire survey. The questionnaire includes five parts: psychological leverage, cognitive evaluation, stress coping, quality of life and personal data. The personal data section includes the patient's gender, age, education level, the time of illness and the type of disease. For details, see the appendix.

### 2.3.1 Psychological Leverage Scale

The foreign scale of Block and Kremen is referred to as ER89, which is developed from adult samples. This scale is widely used, and the questions are relatively simple. There are 14 items on a 4-point scale. The higher the score, the higher the psychological leverage of the person. Luthans has used this scale to measure the psychological leverage level of Chinese workers, which has good reliability (a=o.84) and validity. It has also been used abroad to measure the psychological leverage of cancer patients. After testing with 60 cancer patients in Zhejiang Cancer Hospital, an item analysis was conducted, and it was found that the fifth item "I like to try food that I have never eaten" had an exceptionally low correlation with other items, and this questionnaire was not used in Chinese cancer patients. This item may not be suitable for this study, so it was decided to cut this item. The final questionnaire consists of 13 questions.

### 2.3.2 Cognitive Evaluation Scale

After searching and reading the literature, it was found that there are very few studies and related scales on how cancer patients perceive disease. Therefore, the cognitive evaluation scale for stress was referred to, and the cognitive evaluation scale was compiled based on the interview.

The interview outline of this study is designed according to the research framework, and the main contents are as follows:

1) How the patient evaluated the disease.

2) What is the negative impact of the disease on the patient?

3) What is the positive impact of the disease on the patient.

4) The patient's expectation of the outcome of the disease.

This study interviewed 20 cancer patients in Zhejiang Cancer Hospital, most of whom were 30 to 50 years old, with a wide range of disease distribution. In summary, their understanding of the disease is mainly as follows:

1) Uncertainty about disease outcome

2) Threatened by disease

3) Illness leads to positive outcomes

4) To take some responsibility for the disease

According to the above results, referring to the Work Stress Cognitive Evaluation Scale, the following 18 items were determined for testing:

l) I feel unfair

2) I feel like I don't know what the outcome of my illness will be

3) I feel that my condition may develop for the better

4) This illness has put me in trouble

5) Because of this illness, I may not be able to do my earlier job

6) This illness has made me feel unable to achieve my ideals

7) I do not know what kind of ending I will face

8) This illness has made me feel unable to meet my expectations

9) I feel a lack of control over this illness

10) This illness made me feel like I lost respect from others

11) I feel threatened by disease

12) I feel that I cannot tolerate this illness

13) I feel like friends and relatives might blame me

14) I feel responsible for taking part in therapy

15) I feel some responsibility for this illness

16) I feel that this disease can give me some medical knowledge

17) I feel that my condition can be controlled through treatment

18) I feel that this disease has brought me a lot of attention

After the test of 60 cancer patients, the factor analysis found that the first and fourth items did not have a high load on each factor, so it was decided to cut these two items, and perform factor analysis again to obtain 4 factors. The content of the items contained in each factor was found:

Factor 1 includes item 2, item 5, item 6, item 7, item 8, item 9, which reflects the patient's uncertainty about the outcome of the disease.

Factor 2 includes item 10, item n, item 12 and item 13, reflecting that the patient feels threatened by the disease.

Factor 3 includes items 14 and 2, reflecting the assessment that the patient is responsible for the disease.

Factor 4 includes items 3, 16, 17, and 18, reflecting some positive evaluations of the disease by patients.

Finally, the cognitive evaluation scale of cancer patients composed of the above 16 items was determined, see the appendix.

### 2.3.3 Stress Coping Scale

The Medical Coping Modes Scale (Medical Coping Modes)Questionnaire, M C MQ) is divided into three components: face ( con), avoidance (Avo) and yield (res), which have been proved to have good reliability and validity by many studies.

The original questionnaire structure and content are as follows:

1) Face, including "Would you like yourself to be involved in making various treatment decisions?", "Do you often talk about your disease with relatives and friends?", "For several months, you have learned from doctors, nurses and other knowledgeable people. How much knowledge about the disease do you get there?", "Do you often ask your doctor what to do about your disease?", "In recent months, how much have you learned about your disease from books, magazines, and newspapers? information about the disease?”, “How many questions have you asked the doctor about the disease?”, “When you meet someone with the same disease, how many details about the disease do you usually talk to him about?”, “Family and friends ask you about the disease Do you often talk to him about the details of his illness?".

2) Avoidance, including "When discussing your illness, do you often find yourself thinking about other things?", "Do you often talk to your relatives and friends about things other than illness because you don't think it's necessary to think about your illness in old age? "To what extent does your illness cause you to think more positively about some things in your life?", "When thinking about your illness, do you do other things to distract yourself?" ?'Xi, "When relatives and friends talk to you about your illness, do you often try to change the subject?", "To what extent do you want to forget about your illness?", "Do you often end up watching movies, TV, etc. way to distract yourself from the disease?".

3) Giving in, including "Do you often feel that you have no hope of fully recovering?", "Do you often feel that because of illness, you don't care about all aspects of the future?" Xi, "Do you often feel that Are you going to succumb to the disease?", "Do you often feel that you are powerless against the disease?", "For your disease, do you often feel that you can only resign yourself to fate?".

After a test of 60 cancer patients, a factor analysis was conducted to find out, "To what extent does your disease make you think more positively about some things in your life?", "When discussing your disease, Do you often find yourself thinking about other things?", "When relatives and friends talk to you about your illness, do you often try to change the subject?" and "In recent months, you have Known how much information about your disease" was not high on each factor, decided to delete these 4 items, keep the others, and finally adopted the modified stress coping scale, see appendix.

### 2.3.4 Quality of life scale

The World Health Organization Short Form (WHOQOL - BREF) was used, which has been proved to have good reliability and validity by many studies. Since this questionnaire is a general quality of life questionnaire, in order to be more targeted for cancer patients, a small-scale test was carried out. Finally, after factor analysis, it was found that "Do you think physical pain will prevent you from dealing with what you need to do?", "Do you need medical help with your daily life?", "Do you have opportunities to engage in leisure activities?", "Are you satisfied with the convenience of health care services?" The load on each factor was low (<0.3 ), decided to delete these 4 questions. Therefore, the modified W H O Q O L - B REF scale is used, with a total of 22 questions, see the appendix, of which the first and second questions are the overall evaluation, and the latter questions measure the physical and psychological aspects of the quality of life respectively. , social and environmental 4 sub-aspects.

## 2.4Statistical methods

SPSS10.0 statistical analysis software and AMOS5.0 structural equation modeling software were used to analyze and process the data. The statistical methods used are internal consistency reliability test, variance analysis, factor analysis, correlation analysis, regression analysis and path analysis.

| **Statistical variables** | **Classification** | **Sample size** | **Percentage (%)** |
| --- | --- | --- | --- |
| Gender | Male | 118 | 46 |
|  | Female | 138 | 54 |
| Age | Under 25 | 13 | 5 |
|  | 25-45 years old | 61 | 24 |
|  | 46-60 years old | 117 | 46 |
|  | Over 60 years old | 66 | 25 |
| Education level | Junior high school and below | 54 | 21 |
|  | Secondary school or high school | 89 | 35 |
|  | College or Undergraduate | 104 | 40 |
|  | Graduate and above | 10 | 4 |
| Know when you are sick | Within a week | 6 | 2 |
|  | Two to four weeks | 27 | 11 |
|  | For six months | 115 | 45 |
|  | More than half a year | 52 | 20 |
|  | More than a year | 57 | 22 |
| Type of disease | Breast cancer | 46 | 18 |
|  | Digestive tract cancer | 76 | 30 |
|  | Respiratory cancer | 59 | 23 |
|  | Separability cancer | 8 | 3 |
|  | Gynecological system cancer | 23 | 8 |
|  | Other | 45 | 17 |
| **Total** |  | **257** | **100** |

# Table 2-1 Statistical table of basic situation of valid samples

##

## 2.5 Research result

## 2.5.1 Reliability and validity test of the scale

### 2.5.1.1 Analysis Results of Psychological Leverage Scale

Exploratory factor analysis is conducted on the psychological leverage scale. According to the earlier research and the process of scale development, this questionnaire measures the psychological leverage variable, so the factor analysis determines to select one factor, and the results are shown in Table 2-2. This one factor explained 43.959% of the variance, with an internal consistency coefficient of 0.890. According to Nunnally's opinion, if the internal consistency coefficient is between .70 and .98, the scale has a high level of reliability, less than .35 is unacceptable, and between .35 and .70 is an acceptable range, so this scale The reliability of the table is high. Although the factor loading of item 5 is lower, it is retained due to the higher internal consistency coefficient.

| **Project** | **Factor 1** |
| --- | --- |
| 8. Most of the people I have met are cute | .784 |
| 12. I like to think of myself as having a very strong personality | .773 |
| 1. I am generous to my friends | .760 |
| 4. I often make a good impression in people's minds | .752 |
| 2. In the face of shock, I can quickly recover | .745 |
| 10. I like to challenge new and difficult things | .708 |
| 9. I often think carefully before doing something | .702 |
| 13. I recover quickly from anger | .696 |
| 6. I like to take different paths to familiar places | .644 |
| 7. I am more curious than others | .549 |
| 11. My daily life is full of things that interest me | .487 |
| 3. I love dealing with new and unusual situations | .453 |
| 5. I am considered a very energetic person | .410 |

Table 2-2 Factor analysis results of resilience scale

###

### 2.5.1.2 Analysis results of cognitive evaluation scale

Exploratory factor analysis was conducted on the scale of cognitive evaluation. Based on the design concept of the scale, principal part analysis was used to determine the extraction of 4 factors, and the factor analysis results were obtained after the maximum variance rotation. It conforms to the theoretical conception of the scale. Name these 4 factors: uncertainty about the outcome, feeling threatened, positive evaluation, and accountability. Four factors explained a total of 58.090% of the variance, of which, "uncertainty about the results" explained 20.090% of the variance, "feeling threatened" explained 15.146% of the variance, and "positive evaluation" explained 14.108% of the variance and "take responsibility" explained 8.746% of the variance. The internal consistency coefficients for the 4 factors ranged from .469 to 821.

| **Project** | **Factor 1** | **Factor 2** | **Factor 3** | **Factor 4** |
| --- | --- | --- | --- | --- |
| 6. This illness has made me feel unable to achieve my ideals. | 0.811 | 0.244 | -0.018 | 0.118 |
| 7. This illness has made me feel unable to meet my expectations. | 0.779 | 0.156 | -0.123 | 0.253 |
| 16. I do not know what the outcome of my illness will be. | 0.698 | -0.022 | 0.036 | -0.070 |
| 4. Because of this illness, I may not be able to do my earlier job. | 0.673 | 0.178 | 0.040 | -0.057 |
| 8. I do not know what the outcome will be. | 0.646 | 0.198 | -0.055 | 0.336 |
| 11. I feel like I have no control over this disease. | 0.499 | 0.240 | -0.197 | 0.133 |
| 1. This illness has made me feel that I have lost respect from others. | 0.139 | 0.836 | -0.049 | 0.020 |
| 2. I feel threatened by disease. | 0.284 | 0.739 | 0.054 | 0.055 |
| 3. I feel that I cannot tolerate this disease. | 0.372 | 0.723 | -0.020 | 0.088 |
| 10. I feel like I might be blamed by friends and relatives. | 0.018 | 0.589 | -0.103 | 0.105 |
| 14. I feel that my condition can be controlled with treatment. | -0.110 | -0.076 | 0.815 | 0.109 |
| 12. I feel that my condition may develop for the better. | -0.130 | 0.073 | 0.741 | 0.132 |
| 13. I feel that this disease can give me some medical knowledge. | -0.020 | -0.074 | 0.734 | 0.149 |
| 15. I feel that this disease has brought me a lot of attention. | 0.095 | -0.126 | 0.630 | -0.137 |
| 5. I feel empowered to take part in therapy. | 0.102 | -0.074 | 0.156 | 0.816 |
| 9. I feel some responsibility for this illness. | 0.235 | 0.251 | 0.090 | 0.661 |
| **Variation explained by each factor (%)** | **20.090** | **15.146** | **14.108** | **8.746** |
| **Cumulative Variation Explained (%)** | **20.090** | **35.237** | **49.344** | **58.090** |
| **A Reliability coefficient** | **0.821** | **0.757** | **0.722** | **0.469** |

Table 2-3 Factor Analysis of Cognitive Evaluation Scale

### 2.5.1.3 Analysis results of stress response scale

Exploratory factor analysis was carried out on the stress response scale. Based on the earlier research and the design concept of the scale, three factors were selected by principal component analysis. The results of factor analysis after largest variance rotation are shown in Table 2-4. It basically conforms to the theoretical conception of the scale. Name these 3 factors: face, yield, and avoid. The three factors explained a total of 43.564% of the variance, among which, "face" explained 16.116% of the variance, "avoidance" explained 15.793% of the variance, and "yield" explained 11.655% of the variance. The internal consistency coefficients for the 3 factors ranged from .571 - .737.

Table 2-4 Factor Analysis Results of Stress Coping Scale

| **Project** | **Factor 1** | **Factor 2** | **Factor 3** |
| --- | --- | --- | --- |
| 11. How many questions have you asked your doctor about your illness? | 0.773 | -0.039 | 0.101 |
| 6. Do you often ask your doctor what to do about your disease? | 0.628 | 0.023 | 0.083 |
| 2. Do you often talk to relatives and friends about your illness? | 0.613 | 0.097 | -0.105 |
| 12. When you meet someone with the same disease, how much detail do you usually talk to him about the disease? | 0.600 | 0.030 | -0.215 |
| 10. When relatives and friends ask you about your condition, do you often talk to him about the details of your condition? | 0.578 | 0.079 | -0.070 |
| 1. Would you like yourself to be involved in making various treatment decisions? | 0.514 | -0.207 | 0.069 |
| 4. How much knowledge have you learned about the disease from doctors, nurses, etc. knowledgeable people over the past few months? | 0.496 | -0.147 | 0.278 |
| 16. Do you often feel like you are left to your fate when it comes to your illness? | -0.002 | 0.756 | 0.007 |
| 14. Do you often feel that you are powerless against the disease? | 0.025 | 0.742 | 0.040 |
| 3. Do you often feel like you have no hope of getting back to full health? | -0.027 | 0.742 | 0.014 |
| 9. Do you often feel like you are giving in to illness? | -0.024 | 0.646 | 0.044 |
| 5. Do you often feel that because of illness, you don't care about all aspects of the future? | -0.018 | 0.561 | 0.089 |
| 7. When thinking about your illness, do you do anything else to distract yourself? | 0.018 | 0.121 | 0.760 |
| 15.Do you often talk to relatives and friends about things other than illness because you don't feel the need to think about illness as you get older? | -0.005 | -0.034 | 0.661 |
| 13. Do you often distract yourself from the disease by watching movies, TV, etc.? | 0.046 | 0.149 | 0.582 |
| 8.To what extent do you want to forget about your illness? | -0.003 | -0.010 | 0.581 |
| **Variation explained by each factor (%)** | **16.116** | **15.793** | **11.655** |
| **Cumulative Variation Explained (%)** | **16.116** | **31.909** | **43.564** |
| **Reliability coefficient** | **0.693** | **0.737** | **0.571** |

###

### 2.5.1.4 Analysis results of quality-of-life scale

Table 2-5 Factor Analysis Results of Quality-of-Life Scale

| **Factor** | **Factor 1** | **Factor 2** | **Factor 3** | **Factor 4** |
| --- | --- | --- | --- | --- |
| 1. Ability to carry out daily activities | 0.763 | 0.211 | 0.074 | 0.156 |
| 2. Energy level | 0.721 | 0.163 | 0.219 | 0.102 |
| 3. Satisfaction with sleep | 0.674 | 0.185 | 0.028 | 0.002 |
| 4. Work ability | 0.665 | -0.009 | 0.132 | 0.404 |
| 5. Ability to concentrate | 0.629 | 0.105 | 0.236 | 0.133 |
| 6. Feelings of safety | 0.310 | 0.585 | 0.121 | 0.261 |
| 7. Environmental health | 0.293 | 0.512 | -0.082 | 0.016 |
| 8. Enjoyment of life | 0.214 | 0.102 | 0.773 | 0.062 |
| 9. Acceptance of appearance | 0.221 | 0.194 | 0.683 | 0.150 |
| 10. Sense of life's meaning | 0.116 | 0.121 | 0.669 | 0.275 |
| 11. Satisfaction with oneself | 0.452 | 0.086 | 0.625 | 0.148 |
| 12. Experience of negative feelings | -0.010 | -0.010 | 0.521 | -0.313 |
| 13. Satisfaction with relationships | 0.071 | 0.147 | 0.194 | 0.827 |
| 14. Satisfaction with friends' support | 0.055 | 0.138 | -0.013 | 0.773 |
| 15. Satisfaction with sex life | 0.296 | 0.031 | 0.109 | 0.588 |
| **Variation explained by each factor (%)** | **17.606** | **14.646** | **12.197** | **11.172** |
| **Cumulative variation explained (%)** | **17.606** | **32.252** | **44.449** | **55.621** |
| **Reliability coefficient** | **0.823** | **0.777** | **0.722** | **0.693** |

Exploratory factor analysis was carried out on the scale of quality of life. Based on the previous research and the development process of the scale, this study used principal component analysis to determine the extraction of 4 factors, and obtained the results after the maximum variance rotation, as shown in Table 2-5 . It basically conforms to the theoretical conception of the scale. Only found the fifth question "How good is your ability to concentrate?" The psychological aspect of the quality of life is now classified as a physiological dimension. Through the investigation, it was found that many patients understood this question as their own mental state and decided to use this question. can be kept at physiological latitudes. Name these 4 factors: Physiological, Environmental, Psychological and Social. The four factors explained a total of 55.621% of the variance, among which, "physiology" explained 17.606% of the variance, "environment" explained 14.646% of the variance, "psychological" explained 12.197% of the variance and "society" explained 11.172% of the variance Mutations. The internal consistency coefficients for the 4 factors ranged from .693 to .823.

## 2.6 Descriptive analysis of psychological levers, cognitive assessments, coping styles, and quality of life

### 2.6.1 Descriptive analysis of the overall characteristics of each variable

To understand the overall state of psychological leverage, cognitive evaluation, coping style and quality of life of cancer patients, descriptive statistical analysis of each factor was carried out. The mean and standard deviation of the test on this item are shown in Table 2-6 for specific results.

Table 2-6 Descriptive statistical analysis table for each variable

| **Variable** | **Lowest score** | **Mean ± Standard deviation** | **Highest score** |
| --- | --- | --- | --- |
| Psychological leverage | 1 | 2.864 ± 0.619 | 4 |
| Positive evaluation | 1 | 4.310 ± 0.691 | 5 |
| Take responsibility | 1 | 3.846 ± 1.005 | 5 |
| Feel threatened | 1 | 2.338 ± 0.940 | 5 |
| Uncertainty about results | 1 | 3.121 ± 1.008 | 5 |
| Face | 1 | 2.480 ± 0.471 | 4 |
| Avoid | 1 | 2.421 ± 0.565 | 4 |
| Yield | 1 | 1.752 ± 0.551 | 4 |
| Physiological | 1 | 3.257 ± 0.674 | 5 |
| Psychology | 1 | 3.285 ± 1.675 | 5 |
| Society | 1 | 3.637 ± 0.612 | 5 |
| Surroundings | 1 | 3.213 ± 0.603 | 5 |
| Total score | 1 | 3.272 ± 0.473 | 5 |

The results showed that the overall score of psychological leverage of cancer patients was higher than the average; in terms of cognitive evaluation, positive evaluation, taking responsibility and uncertainty about the results were higher than the average, while feeling threatened was lower than the average; in terms of coping style, Facing and avoiding coping were higher than average, yielding coping was lower than average; in terms of quality of life, the total score and all aspects of quality of life were higher than average.

### 2.6.2 Descriptive analysis of quality of life in cancer patients and its sub-aspects

To understand the difference in the feeling of various aspects of the quality of life of cancer patients, a comparative analysis was carried out on various aspects of the quality of life of cancer patients. (Figure 2-2).

Figure 2-2

To understand the distribution of cancer patients' evaluation of various aspects of quality of life, the scores of cancer patients in various aspects of quality of life were analyzed. Three points are moderate feelings, and the evaluation percentages of less than 3 points and greater than 3 points are calculated, respectively. The results show that cancer patients' evaluation of all aspects of quality of life is more than 3 points (moderate) in the majority, and all are higher than 50%, Table 2-7.

Table 2-7 Overall situation of quality of life of cancer patients

| **Quality of Life** | **less than 3** | **greater than 3** |
| --- | --- | --- |
| Physiological aspects | 30% | 60% |
| Psychological aspect | 21% | 59% |
| Social aspect | 8% | 78% |
| Environmental aspects | 29% | 58% |
| Total score | 26% | 70% |

## 2.7 Analysis of the relationship between psychological leverage, cognitive evaluation, coping and quality of life.

### 2.7.1 Correlation analysis of psychological leverage, cognitive evaluation, coping style and quality of life.

To examine the relationship between psychological leverage, cognitive evaluation, coping style and quality of life, a correlation analysis was performed on them, as shown in Table 2-8. the result shows:

1) Psychological leverage is positively correlated with positive evaluation, coping, total quality of life scores, and physiological and environmental aspects of quality of life, negatively correlated with uncertainty about outcomes, yielding to coping, and with taking responsibility, feeling threatened, and avoiding coping, psychological and social aspects of quality of life were not related.

2) Positive evaluation is negatively correlated with yielding coping; taking responsibility is positively correlated with facing and avoiding coping; uncertain evaluation of the outcome is positively correlated with avoidance and yielding coping; feeling threatened is positively correlated with avoidance and yielding coping.

3) Positive evaluation is positively related to all aspects of quality of life, responsibility is not related to all aspects of quality of life, uncertainty about results and feeling threatened are negatively related to all aspects of quality of life, except feeling threatened and quality of life. Psychologically irrelevant.

4) There is no significant correlation between confrontation and avoidance and quality of life, only the coping style of yielding has a positive correlation with all aspects of quality of life.

Table 2-8 Correlation analysis of resilience, cognitive assessment, coping style and quality of life

|  |  |  |  |
| --- | --- | --- | --- |
|  | Cognitive evaluation | Solution | Quality of Life |
| Cognitive evaluation |  | psychological leverage | positive evaluation | take responsibility | Uncertainty about results | feel threatened | face | avoid | yield | physiological | psychology | society | surroundings | total score |
| psychological leverage | 1 |  |  |  |  |  |  |  |  |  |  |  |  |
| positive evaluation | .138\* | 1 |  |  |  |  |  |  |  |  |  |  |  |
| take responsibility | -.079 | .190\*\* | 1 |  |  |  |  |  |  |  |  |  |  |
| Not sure about the result | -.143\* | -.112 | .354\*\* | 1 |  |  |  |  |  |  |  |  |  |
| feel threatened | -.091 | -.089 | .236\*\* | .483\*\* | 1 |  |  |  |  |  |  |  |  |
| Solution | face | .126\* | .071 | .203\*\* | .100 | .104 | 1 |  |  |  |  |  |  |  |
| avoid | .080 | .014 | .129\* | .181\* | .124\* | .025 | 1 |  |  |  |  |  |  |
| yield | -.148\* | -.271\*\* | -.036 | .446\*\* | .381\*\* | -.054 | .115 | 1 |  |  |  |  |  |
| Quality of Life | physiological | .1900\*\* | .195\*\* | -.025 | -.294\*\* | -.159\* | -.032 | -.080 | -.383\*\* | 1 |  |  |  |  |
| psychology | .148 | .157\* | .063 | -.156\* | -.121 | 0.86 | .014 | -.334\*\* | .441\*\* | 1 |  |  |  |
| society | .059 | .171\*\* | -.027 | -.213\* | -.252\*\* | -.028 | -.097 | -.270\*\* | .370\*\* | .275\*\* | 1 |  |  |
| surroundings | .151\* | .217\*\* | -.114 | -.359\* | -.164\*\* | .007 | -.068 | -.327\*\* | 442\*\* | .287\*\* | .319\*\* | 1 |  |
| total score | .210\* | .257\* | -.047 | -.375\* | -.229\* | .019 | -.085 | -.482\* | .833\*\* | .700\*\* | .568\*\* | .722\*\* | 1 |

### 2.7.2 Regression analysis of psychological leverage, cognitive evaluation, and coping style on quality of life

From the correlation analysis results, the psychological leverage of cancer patients is related to positive evaluation and uncertainty about the results, it is related to the coping style of facing and yielding, and it has nothing to do with the coping style of avoidance, and psychological leverage is also related to the quality of life. The relationship between the cognitive evaluation of the disease and the quality of life is mainly reflected in two aspects: positive evaluation and uncertainty about the results. The relationship between the coping style of the disease and the quality of life is mainly reflected in the submissive coping. In order to further analyze the relationship between psychological leverage, cognitive evaluation, coping style and quality of life, regression analysis was carried out with the variables of psychological leverage, cognitive evaluation and coping style as independent variables, and quality of life as dependent variable. Here the quality of life is calculated according to the total score of physiology, psychology, society and environment, indicating the overall state. Get the relationship between them, as shown in Table 3-8. It can be seen from the table that psychological leverage, positive evaluation, uncertainty about results, and submissive coping have significant regression effects on quality of life. Among them, uncertainty in results and submissive coping have very significant regression effects on quality of life, while burden Responsibility, feeling threatened, facing, and avoiding had no significant regression effects on quality of life. Such results suggest that psychological leverage, positive appraisals, uncertainty about outcomes, and submissive coping can predict quality of life, whereas feeling threatened and confrontation do not. In terms of the physiological aspects of quality of life, psychological leverage, uncertainty about the outcome, and submissive coping had significant regression effects on the physiological aspects of quality of life, as shown in Table 2-9. In the psychological aspect of the quality of life, there is a significant regression effect of coping with surrender on the psychological aspect of the quality of life, as shown in Table 2-10. In the social aspect of quality of life, feeling threatened and succumbing to coping have significant regression effects on the social aspect of quality of life, see Table 2-11. In the environmental aspects of quality of life, positive evaluation, uncertainty about results, and submissive coping have significant regression effects on the environmental aspects of quality of life, as shown in Table 2-12.

Table 2-9 Multiple regression analysis of psychological leverage, cognitive evaluation, and coping style on quality of life

| **Variable** | **Regression Coefficient** | **Standard Regression Coefficient** | **Significance Level** |
| --- | --- | --- | --- |
| Psychological leverage | 0.151 | 0.117\* | 0.037 |
| Positive evaluation | 0.484 | 0.128\* | 0.025 |
| Take responsibility | -0.052 | -0.010 | 0.870 |
| Feel threatened | 0.072 | 0.026 | 0.680 |
| Uncertainty about results | -0.328 | -0.191\*\* | 0.006 |
| Face | -0.015 | -0.005 | 0.931 |
| Avoid | -0.108 | -0.023 | 0.669 |
| Yield | -1.333 | -0.353\*\* | 0.000 |
|  |  |  |  |
| R=.544 |  |  |  |
| R² = .296 |  |  |  |
| Correction R² = .273 |  |  |  |
| F = 13.011\*\* |  |  |  |

Note: \*\* p <.01, \*p <.05, dependent variable: quality of life

Table 2-10 Multiple regression analysis of psychological levers, cognitive evaluations, and coping styles on the physiological aspects of quality of life

| **Variable** | **Regression Coefficient** | **Standard Regression Coefficient** | **t-value** | **Significance Level** |
| --- | --- | --- | --- | --- |
| Psychological leverage | 0.037 | 0.087 | 1.419 | 0.157 |
| Positive evaluation | 0.059 | 0.048 | 0.760 | 0.448 |
| Take responsibility | 0.082 | 0.049 | 0.711 | 0.478 |
| Feel threatened | -0.001 | -0.001 | -0.020 | 0.984 |
| Uncertainty about results | -0.020 | -0.037 | -0.475 | 0.635 |
| Face | -0.050 | 0.048 | -0.788 | 0.432 |
| Avoid | -0.058 | 0.039 | 0.640 | 0.523 |
| Yield | -0.537 | -0.290\*\* | -4.050 | 0.000 |
|  |  |  |  |  |
| R = 0.362 |  |  |  |  |
| R² = 0.131 |  |  |  |  |
| Correction R² = 0.103 |  |  |  |  |
| F = 4.682\*\* |  |  |  |  |

Note: \*\* p <.01, \*p <.05, dependent variable: physiological

Table 2- 11 Multiple regression analysis of psychological aspects of psychological leverage, cognitive evaluation, and coping style on quality of life

| **Dependent variable** | **Independent variable** | **Regression coefficients** | **Standard regression coefficients** | **t value** | **Significant level** |
| --- | --- | --- | --- | --- | --- |
| Psychological leverage |  | 0.037 | 0.087 | 1.419 | 0.157 |
| Positive evaluation |  | 0.059 | 0.048 | 0.760 | 0.448 |
| Take responsibility |  | 0.082 | 0.049 | 0.711 | 0.478 |
| Feel threatened |  | -0.001 | -0.001 | -0.020 | 0.984 |
| Uncertainty about results |  | -0.020 | -0.037 | -0.475 | 0.635 |
| Face |  | -0.050 | 0.048 | -0.788 | 0.432 |
| Avoid |  | -0.058 | 0.039 | 0.640 | 0.523 |
| Yield |  | -0.537 | -0.290\*\* | -4.050 | 0.000 |
|  |  |  |  |  |  |
| R = 0.362 |  |  |  |  |  |
| R² = 0.131 |  |  |  |  |  |
| Correction R² = 0.103 |  |  |  |  |  |
| F = 4.682\*\* |  |  |  |  |  |

Note: \*\* p <.01, \*p <.05, dependent variable: psychological

Table 2- 12 Multiple regression analysis of social aspects of quality of life on psychological levers, cognitive assessments, and coping styles

| **Dependent variable** | **Independent variable** | **Regression coefficients** | **Standard regression coefficients** | **t value** | **Significant level** |
| --- | --- | --- | --- | --- | --- |
| Psychological leverage | .020 | .009 | .141 | .888 |  |
| positive evaluation | .072 | .109 | 1.702 | .090 |  |
| take responsibility | .013 | .014 | .203 | .839 |  |
| feel threatened | -.074 | -.152\* | -2.153 | .032 | \* |
| Uncertainty about results | -.015 | -.050 | -.649 | .517 |  |
| face | -.015 | .026 | -.418 | .676 |  |
| avoid | -.045 | .055 | .897 | .371 |  |
| yield | -.102 | -.153\* | -2.112 | .036 | \* |
|  |  |  |  |  |  |
| R=.339 |  |  |  |  |  |
| R2=.115 |  |  |  |  |  |
| CorrectionR2=.87 |  |  |  |  |  |
| F=4.031\*\* |  |  |  |  |  |

Note: \*\* p < .01, \*p < .05, dependent variable: social

Table 2- 13 Multiple regression analysis of psychological leverage, cognitive evaluation, and coping style on environmental aspects of quality of life

| **Dependent variable** | **Independent variable** | **Regression coefficients** | **Standard regression coefficients** | **t-value** | **significant level** |
| --- | --- | --- | --- | --- | --- |
| Psychological leverage | .029 | .066 | 1.103 | .271 | - |
| positive evaluation | .192 | .147\* | 2.407 | .017 | \*\* |
| take responsibility | -.126 | -.070 | -.1067 | .287 | - |
| feel threatened | .065 | .068 | 1.007 | .315 | - |
| Uncertainty about results | -.153 | -.265\*\* | -3.451 | .001 | \*\* |
| face | .011 | .010 | .177 | .860 | - |
| avoid | -.011 | -.007 | -.116 | .908 | - |
| yield | -.250 | -.190\*\* | -2.750 | .006 | \*\* |
| R | .439 |  |  |  |  |
| R2 | .193 |  |  |  |  |
| CorrectionR2 | .167 |  |  |  |  |
| F | 7.421\*\* |  |  |  |  |

Note: \*\* p <.01,\*p <.05 , dependent variable: environment

### 2.7.3 Analysis of the mediating effect of cognitive evaluation and coping style on psychological leverage and quality of life

From the conception of the study, and according to the results of correlation analysis and regression analysis, positive evaluation, uncertainty about the results and succumbing to coping play a very important role in the relationship between psychological leverage and quality of life. In order to further illustrate the relationship between them, a mediation analysis was carried out on psychological leverage, positive evaluation, uncertainty about the outcome, submissive coping and quality of life. According to Baron's method of testing the mediation effect, the following series of regression analysis were used to test.

**2.7.3.1 Analysis of the mediating effect of positive evaluation on psychological leverage and submissive coping.**

The results of the mediation analysis of positive evaluation between psychological leverage and yielding coping are shown in Table 2-14. The results show that the regression coefficient of psychological leverage on yielding coping becomes insignificant after adding positive evaluation, indicating that positive evaluation is in the middle of psychological leverage and yielding coping. Completely mediated, as shown in Figure2-3.

Table 2-14 Analysis of the mediating effect of positive evaluation on psychological leverage and yielding

|  | **Equation 1** | **Equation 2** | **Equation 3** |
| --- | --- | --- | --- |
| Dependent Variable | Yield | Yield | Yield |
| Independent Variable | Psych. Lev. | Psych. Lev. | Psych. Lev. |
| Mediating Variable | Pos. Eval. | NA | Pos. Eval. |
| Coefficient (Psych. Lev.) | -0.148\* | -0.113 | -0.131 |
| Coefficient (Pos. Eval.) | -0.271\*\* | NA | -0.255\*\* |
| F Value | 4.985\* | 20.225\*\* | 5.722\* |
| R2 | 0.019 | 0.073 | 0.022 |
| Correction R2 | 0.015 | 0.070 | 0.018 |

Note: \*\*p <.01, \*p <.05

****

Figure 2-3 The complete mediating effect of positive evaluation between resilience and yielding.

**2.7.3.2 Analysis of the mediating effect of uncertainty about the outcome between psychological leverage and yielding**

An analysis of the mediating effect of uncertainty about the outcome between psychological leverage and yielding coping is shown in Table 2-15. The results show that the regression coefficient of psychological leverage on yielding coping becomes insignificant after adding uncertainty about the outcome. Uncertain evaluation of β was fully mediated between psychological leverage and yielding coping, as shown in Figure 2-4.

Table 2-15 Analysis of the mediating effect of uncertainty on results between psychological leverage and yielding

|  | **Equation 1** | **Equation 2** | **Equation 3** |
| --- | --- | --- | --- |
| Dependent variable | Positive evaluation | Yield | Yield step 1 |
| Independent variable | Psychological leverage | -0.143\* | -0.148\* |
| Mediating variable | Positive review | -0.446\*\* | -0.433\*\* |
| Equation F value | 4.985\* | 20.225\*\* | 5.722\* |
| R2 | 0.019 | 0.073 | 0.022 |
| Correction R2 | 0.015 | 0.070 | 0.018 |

Note: \*\*p <.01, \*p <.05

****

Figures 2-4 The complete mediation effect of uncertainty on outcome between psychological leverage and yield

**2.7.3.3 Analysis of the mediating effect of positive evaluation on psychological leverage and quality of life**

An analysis of the mediating effect of positive evaluation between psychological leverage and quality of life is shown in Table 2-16. The results show that the regression coefficient of psychological leverage on quality of life is reduced after adding positive evaluation, indicating that positive evaluation plays a part in the relationship between psychological leverage and quality of life. intermediary, as shown in Figure 2-5.

Table 2-16 Analysis of the mediating effect of positive evaluations on resilience and quality of life

|  | **Equation 1** | **Equation 2** | **Equation 3** |
| --- | --- | --- | --- |
| Dependent Var. | Positive evaluation quality of life | Quality of life step 1 | Quality of life step 2 |
| Independent Var. | Psychological leverage (0.138\*) | N/A | Quality of life step 1 (-0.178\*\*) and Positive reviews (0.232\*\*) |
| Mediating Var. | N/A | Positive reviews (0.257\*\*) | N/A |
| F Value | 4.985\* | 17.978\*\* | 11.764\*\* |
| p-value | < .05 | < .01 | < .05 |
| R-squared | 0.019 | 0.066 | 0.044 |
| Corrected R-squared | 0.015 | 0.062 | 0.040 |

Note: \*\*p <.01, \*p <.05

****

Figure 2-5 Partial mediating effect of positive evaluation on resilience and quality of life

**2.7.3.4 Analysis of the mediating effect of uncertainty about the outcome between psychological leverage and quality of life**

An analysis of the mediating effect of uncertainty about the outcome between psychological leverage and quality of life is shown in Table 2-17. The results show that the regression coefficient of psychological leverage on quality of life is reduced after adding uncertainty about the outcome, indicating that uncertainty about the outcome is in the psychological leverage and quality of life partially mediate, as shown in Figure 2-6.

Table 2-17 Analysis of the mediating effect of uncertainty on outcomes between resilience and quality of life

|  | **Equation 1** | **Equation 2** | **Equation 3** | **Equation 4** |
| --- | --- | --- | --- | --- |
| Dependent Var. | Positive evaluation | Quality of life | Quality of life step 1 | Quality of life step 2 |
| Independent Var. | Psychological leverage (-0.143\*) | N/A | Quality of life step 1 (0.160\*\*) and Positive evaluation (0.210\*\*) | N/A |
| Mediating Var. | Uncertainty about result (-0.375\*\*) | Uncertainty about result (-0.352\*\*) | N/A | Uncertainty about result (-0.335\*\*) |
| F Value | 5.346\* | 41.736\*\* | 11.764\*\* | 25.201\*\* |
| p-value | < .05 | < .01 | < .01 | < .01 |
| R-squared | 0.021 | 0.141 | 0.044 | 0.166 |
| Corrected R-squared | 0.017 | 0.137 | 0.040 | 0.159 |

Note: \*\*p <.01, \*p <.05

****

Figures 2-6 Partial mediating effect of uncertainty on outcome between resilience and quality of life

**2.7.3.5 Analysis of the mediating effect of submissive coping between positive evaluation and quality of life**

See Table 2-18 for an analysis of the mediating effect of succumbing coping between positive evaluation and quality of life. The results show that the regression coefficient of positive evaluation on quality of life after adding succumbing to coping decreases, and it is not as significant as before, showing that succumbing Positive evaluation and quality of life partially mediate, as shown in Figure 2-7.

Table 2-18 Analysis of the mediating effect of yielding on positive evaluation and quality of life.

|  | **Equation 1** | **Equation 2** | **Equation 3** | **Equation 4** |
| --- | --- | --- | --- | --- |
| Dependent Var. | Yield | Quality of life | Quality of life step 1 | Quality of life step 2 |
| Independent Var. | Positive Reviews (-0.271\*\*) | N/A | Quality of life step 1 (0.136\*\*) and Positive Reviews (0.527\*\*) | N/A |
| Mediating Var. | Yield (-0.482\*\*) | Yield (-0.445\*\*) | N/A | N/A |
| F Value | 20.225\*\* | 77.250\*\* | 17.978\*\* | 42.247\*\* |
| p-value | < .01 | < .01 | < .01 | < .01 |
| R-squared | 0.073 | 0.233 | 0.066 | 0.250 |
| Corrected R-squared | 0.070 | 0.229 | 0.062 | 0.244 |

Note: \*\*p <.01, \*p <.05

****

Figure 2-7 Partial mediating effect of yielding on positive evaluation and quality of life.

**2.7.3.6 Analysis of the mediating effect of yield coping between uncertainty of outcome and quality of life**

An analysis of the mediating effect of yield coping between the uncertainty of the outcome and the quality of life is shown in Table 2-19. The results show that the regression coefficient of the uncertainty of the outcome on the quality of life is reduced after the yield coping is added. Partial mediation between determination and quality of life, as shown in Figure 2-8.

Table 2-19 Analysis of the mediating effect of yielding on uncertainty about outcomes and quality of life

|  | **Equation 1** | **Equation 2** | **Equation 3** | **Equation 4** |
| --- | --- | --- | --- | --- |
| Dependent Var. | Yield | Quality of life | Quality of life step 1 | Quality of life step 2 |
| Independent Var. | Uncertainty about result (-0.446\*\*) | N/A | Quality of life step 1 (-0.375\*\*) and Uncertainty about result (-0.200\*\*) | N/A |
| Mediating Var. | Yield (-0.482\*\*) | Yield (-0.393\*\*) | N/A | N/A |
| F Value | 63.196\*\* | 77.250\*\* | 41.736\*\* | 45.674\*\* |
| p-value | < .01 | < .01 | < .01 | < .01 |
| R-squared | 0.199 | 0.233 | 0.141 | 0.265 |
| Corrected R-squared | 0.195 | 0.229 | 0.137 | 0.259 |

Note: \*\*p <.01, \*p <.05

****

Figures 2-8 Partial mediation of yielding between uncertainty about outcomes and quality of life.

**2.7.3.7 Analysis of the mediating effect of positive evaluation on psychological leverage and physiological aspects of quality of life.**

Table 2-20 Analysis of the mediating effect of positive evaluation on resilience and physiology

|  | **Equation 1** | **Equation 2** | **Equation 3** | **Equation 4** |
| --- | --- | --- | --- | --- |
| Dependent Var. | Positive Evaluation Physiology | Physiological Step 1 | Physiological Step 2 | N/A |
| Independent Var. | Psychological leverage (-0.138\*) | N/A | Physiological Step 1 (0.190\*\*) and Psychological leverage (0.166\*\*) | N/A |
| Mediating Var. | Positive reviews (0.195\*\*) | Positive reviews (0.172\*\*) | N/A | N/A |
| F Value | 4.985\* | 10.090\*\* | 9.517\*\* | 8.835\*\* |
| p-value | < .05 | < .01 | < .01 | < .01 |
| R-squared | 0.019 | 0.038 | 0.036 | N/A |
| Corrected R-squared | 0.015 | 0.034 | 0.032 | N/A |

Note: \*\*p <.01, \*p <.05

In correlation analysis, it was found that psychological levers were only related to the physiological and environmental aspects of quality of life, while regression analysis showed that psychological levers could predict the physiological aspects of patients' quality of life. To further illustrate their relationship, a mediation effect analysis was performed on the physiological aspects of psychological leverage, positive evaluation, uncertainty about outcome, succumbing to coping, and quality of life. An analysis of the mediating effect of positive evaluation on psychological leverage and physiological aspects is shown in Table 2-20. The results show that after adding positive evaluation, the regression coefficient of psychological leverage on physiological aspects becomes smaller, and positive evaluation plays a part in the relationship between psychological leverage and physiological aspects. For the role of mediators, see Figure 2-9.

****

Figure 2-9 Partial mediating effect of positive evaluation between resilience and physiology

**2.7.3.8 The mediating effect of uncertainty on outcome between psychological leverage and the physiological aspects of quality of life**

After the uncertainty of the results, the regression coefficient of the psychological lever on the physiological aspect became smaller, and the uncertainty of the result played a partial mediating role between the psychological leverage and the physiological aspect, as shown in Figure 2-10

Table 2 - 21 Analysis of the mediating effect of uncertainty on the outcomes between resilience and physiology

|  | **Equation 1** | **Equation 2** | **Equation 3** |
| --- | --- | --- | --- |
| Dependent Variable | Uncertainty about the outcomes | Physiology | Physiological Step 1 |
| Independent Variable | Psychological leverage (-.143\*) | Psychological leverage (.190\*\*) | Psychological leverage (.151\*) |
| Mediating Variable | Uncertainty about result (-.294\*\*) | Uncertainty about result (-.273\*\*) | N/A |
| Equation F value | 5.346\* | 24.192\*\* | 9.517\*\* |
| R2 | .021 | .087 | .036 |
| Correction R2 | .017 | .083 | .032 |

Note: \*\*p <.01, \*p <.05

In Equation 1, the dependent variable is uncertainty about the outcomes, with psychological leverage as the independent variable and uncertainty about the result as the mediating variable. The Equation 1 F value is 5.346\*, and the R2 and correction R2 are .021 and .017, respectively.

In Equation 2, the dependent variable is physiology, with psychological leverage as the independent variable and uncertainty about the result as the mediating variable. The Equation 2 F value is 24.192\*\*, and the R2 and correction R2 are .087 and .083, respectively.

In Equation 3, the dependent variable is physiological step 1, with psychological leverage as the independent variable. The Equation 3 F value is 9.517\*\*, and the R2 and correction R2 are .036 and .032, respectively. There is no mediating variable in Equation 3.

In Equation 4, the dependent variable is physiological step 2, with psychological leverage as the independent variable. The Equation 4 F value is 15.514\*\*, and the R2 and correction R2 are .109 and .102, respectively. There is no mediating variable in Equation 4.

****

Figure 2-10 Partial mediating effect of uncertainty on outcome between resilience and physiology

**2.7.3.9 Analysis of the mediating effect of submissive coping between positive evaluation and physiological aspects of quality of life**

The mediating effect of yielding coping between positive evaluation and the physiological aspects of quality of life is shown in Table 2-22. The results show that after adding yielding coping, the regression coefficient of positive evaluation on physiological aspects becomes insignificant, indicating that yielding coping plays a significant role in positive evaluation and physiological aspects. Aspects play a complete mediating role, as shown in Figure 2-11.

Table 2-22 Analysis of the mediating effect of yielding on positive evaluation and physiology

|  | **Equation 1** | **Equation 2** | **Equation 3** | **Equation 4** |
| --- | --- | --- | --- | --- |
| Dependent Variable | Yield | Physiology | Physiological Step 1 | Physiological Step 2 |
| Independent Variable | Positive Reviews |  |  |  |
| Mediating Variable | Yield |  |  |  |
| Positive Reviews | -0.271\*\* |  | 0.195\*\* | 0.098 |
| Mediating Variable | -0.383\*\* | -0.357\*\* |  |  |
| Equation F value | 20.225 \*\* | 43.959 \*\* | 10.090 \*\* | 23.475 \*\* |
| R2 | 0.073 | 0.147 | 0.038 | 0.156 |
| Correction R2 | 0.070 | 0.144 | 0.034 | 0.149 |

Note: \*\*p <.01, \*p <.05

****

Figure 2-11 The mediating effect of yielding between positive evaluation and physiology.

**2.7.3.10 An analysis of the mediating effect of yielding coping between uncertainty about outcomes and physiological aspects of quality of life**

The mediating effect of yield coping between the uncertainty of the outcome and the physiological aspects of quality of life is shown in Table 2-23. The results show that after adding yield coping, the regression coefficient of the uncertainty of the outcome to the physiology is reduced, showing that yield plays a significant role in the outcome. The uncertainty and physiology play a partial mediating role, as shown in Figure 2-12.

Table 2-23 Analysis of the mediating effect of yielding on the uncertainty of the outcome and physiology

|  | **Equation 1** | **Equation 2** | **Equation 3** |
| --- | --- | --- | --- |
| Dependent Variable | Yield | Physiological | Physiological Step 1 |
| Independent Variable |  |  |  |
| Uncertainty about results | 0.446\*\* | 0.294\*\* | -0.154\* |
| Mediating Variable |  |  |  |
| Yield | -0.383\*\* | -0.315\*\* |  |
| Equation F value | 63.196\*\* | 43.959\*\* | 24.192\*\* |
| R2 | 0.199 | 0.147 | 0.087 |
| Correction R2 | 0.195 | 0.144 | 0.083 |

Note: \*\*p <.01, \*p <.05

****

Figure 2-12 Partial mediation of yield between uncertainty about outcomes and physiology

### 2.7.4 Path Analysis of Psychological Leverage, Cognitive Evaluation, Coping Style, and Quality of Life

**2.7.4.1 Psychological leverage, positive evaluation, uncertainty about outcomes, submissive coping and quality of life**

The analysis of the mediating effect found that positive evaluation played a full mediating role between psychological leverage and yielding coping and played a partial mediating role between psychological leverage and quality of life. Uncertainty about outcomes played a full mediating role between psychological leverage and yielding coping, and a partial mediating role between psychological leverage and quality of life. Submission coping partially mediated the relationship between positive evaluation and quality of life, and partially mediated between uncertainty about outcomes and quality of life. Based on the above results, a model was initially established among psychological leverage, positive evaluation, uncertainty about results, succumbing to coping and quality of life, as shown in Figure 2-13. Further verification by Amos, the result is shown in Figure 2-14.

There are many measures of how well the model fits. The most commonly used is the chi-square test of goodness of fit, the larger the chi-square value, the worse the fit. Although the chi-square test provides information on whether the model is statistically successful, the chi-square value is affected by the sample size, and often cannot judge the model's fit well. In order to reduce the influence of the sample size on the test, a common method is to take the ratio of the chi-square value to the degrees of freedom. If the ratio is less than 2, the model is considered to fit well. In addition, RMSEA, GFI, CFI, NFI and IFI are also used to evaluate model fit indicators. The results show that the fitting degree of this model is relatively good, Table 2-24.

****

Figure 2-13 Model diagram of the relationship between psychological leverage, positive evaluation, uncertainty about the outcome, yielding, and quality of life.

****

Figure 2-14 Results of the relationship between psychological leverage, positive evaluation, uncertainty about the outcome, yielding, and quality of life.

Table 2-24 Model Fitting Index

| **Index** | **Index value** | **Explanation and interpretation** |
| --- | --- | --- |
| Goodness-of-fit chi-square test X2 | 3.438 | Indicates the degree of discrepancy between the observed and expected data in the model. A lower value indicates a better fit. |
| Degrees of freedom def. | 2 | The number of estimated parameters in the model. |
| Approximate root means square error RMSEA | .053 | Indicates the average difference between the observed and expected covariance matrices. A value of less than .08 indicates that the model fits well. |
| Goodness of fit index GFI | .995 | Measures how well the model reproduces the observed covariance matrix. A value greater than .9 shows that the model fits well. |
| Normalized Fit Index NFI | .980 | Measures the relative improvement in fit when comparing the target model with the null model. A value greater than .9 shows that the model fits well. |
| Relative Fit Index CFI | .991 | Measures how well the model fits the data in comparison to a baseline model. A value greater than .9 shows that the model fits well. |
| Incremental Fit Index IFI | .992 | Measures how well the model fits the data in comparison to a baseline model. A value greater than .9 shows that the model fits well. |

**2.7.4.2 Psychological leverage, positive evaluation, uncertainty about outcomes, submissive coping, and physiological relationships**

Based on the analysis results of the mediating effect, positive evaluation plays a partial mediating role between psychological leverage and physiology, while uncertainty about the outcome plays a partial mediating role between psychological leverage and physiology; surrender coping plays a complete role between positive evaluation and physiology. The mediating effect played a partial mediating role between the uncertainty of the outcome and the physiology. A model of psychological leverage, positive evaluation, uncertainty about the outcome, yielding coping, and physiology was initially established, as shown in Figure 2-15. Further verified by Amos,The results are shown in Figure 2-16, and the results of the model are shown in Table 2-25. All indicators meet the conditions, and the model fits well.

****

Figure 2-15 Model diagram of the relationship between resilience, positive evaluation, uncertainty about outcomes, yielding, and physiology.

****

Figure 2-16 Results of the relationship between psychological leverage, positive evaluation, uncertainty about the outcome, yielding, and physiology

Table 2-25 Model Fitting Index

| **Index** | **Index value** | **Explanation and Explanation** |
| --- | --- | --- |
| Goodness of fit chi-square test X2 | 5.636 |  |
| Degrees of freedom def. | 3 |  |
| Approximate root means square error RMSEA | .059 | A value of <.08 indicates a good model fit |
| Goodness of fit index GFI | .991 | A value >.9 indicates that the model fits well. |
| Normalized fit index NFI | .960 | A value >.9 indicates that the model fits well. |
| Relative fit index CFI | .980 | A value >.9 indicates that the model fits well. |
| Incremental Fit Index IFI | .981 | A value >.9 indicates that the model fits well. |

Note: The "Explanation and Explanation" column for the first index is empty because no explanation was provided for it.

##

## 2.8 Analysis of demographic variables

### 2.8.1 Gender differences in psychological leverage, cognitive evaluation, coping style and quality of life.

Gender can affect each person's response to events. Therefore, to examine the gender differences of various variables in cancer patients, the mean and standard deviation of psychological leverage, cognitive evaluation, coping style, and quality of life of patients with different genders are shown in Appendix Table 1. After independent sample t-test, it was found that there was no significant gender difference in psychological leverage, cognitive evaluation and quality of life, only the avoidance coping in coping style was different in gender, see Table 2-26. To further analyze the differences in avoidance, It was found that men's avoidance coping scores were higher than women's, see Figure 2-17.

Table 2-26 Gender t-test for each variable

| **Variable** | **t value** | **Significant level (p)** |
| --- | --- | --- |
| Cognitive Assessment Resilience | 1.746 | 0.082 |
| Positive evaluation | 0.583 | 0.561 |
| Take responsibility | 1.578 | 0.116 |
| Feel threatened | 1.306 | 0.193 |
| Uncertainty about results | -0.142 | 0.888 |
| Face to way face | 1.344 | 0.180 |
| Avoid | -2.165 | 0.031 |
| Yield | -0.272 | 0.786 |
| Overall Quality of Life Score | 0.081 | 0.935 |
| Physiological | 1.856 | 0.065 |
| Psychology | -1.077 | 0.282 |
| Society | -1.396 | 0.164 |
| Surroundings | -0.520 | 0.604 |

Note: \*\*p <.01, \*p <.05

Figure 2-17 Analysis of gender differences in avoidance coping

### 2.8.2 Age-related differences in psychological leverage, cognitive evaluation, coping style and quality of life.

Age can affect an individual's cognition and coping of events, so the differences in age of each variable in cancer patients are examined. The mean and variance of psychological leverage, cognitive evaluation, coping style and quality of life in patients of different ages are shown in Appendix Table 2. After analysis of variance, the results showed that there was no significant difference in psychological leverage and coping style among all age groups. There was no difference in age group in cognitive evaluation of positive evaluation, taking responsibility and feeling threatened, only the uncertainty of the results differed in age group. There are differences in the psychological aspects of the quality of life in terms of age, and there are no significant differences in the social, environmental and physical aspects of the age, see Table 2-27. To further analyze the differences, in terms of uncertainty about the results, the scores of the 46-60-year-old age group were significantly higher than other age groups, while the 46-60-year-old age group was lower than the 25-45-year-old age group in terms of the physiological aspects of quality of life. See Tables 2-29, 2-29 and Figures 2-18, 2-19.

Table 2-27 Analysis of variance of age on each variable

| **Source of Variation** | **Sum of Squares** | **Degrees of Freedom** | **Mean Square** | **F Value** | **Significant Level** |
| --- | --- | --- | --- | --- | --- |
| Cognitive Assessment Resilience - Between groups | 2.829 | 3 | .943 | 2.498 | .060 |
| Cognitive Assessment Resilience - s | 95.476 | 253 | .377 |  |  |
| Positive Evaluation - Between groups | 1.341 | 3 | .447 | .937 | .424 |
| Positive Evaluation - s | 120.724 | 253 | .477 |  |  |
| Take Responsibility - Between groups | .271 | 3 | .090 | .089 | .966 |
| Take Responsibility - s | 258.408 | 1.021 |  |  |  |
| Feel Threatened - Between groups | 3.288 | 3 | 1.096 | 1.242 | .295 |
| Feel Threatened - s | 223.261 | 253 | .882 |  |  |
| Uncertainty between groups on outcome - Determine how to deal with | 9.338 | 3 | 3.113 | 3.135\* | .026 |
| Uncertainty between groups on outcome - s | 251.243 | 253 | .993 |  |  |
| Face to way face - Between groups | .169 | 3 | .056 | .252 | .860 |
| Face to way face - s | 56.512 | 253 | .223 |  |  |
| Avoid - Between groups | .220 | 3 | .073 | .227 | .877 |
| Avoid - s | 81.497 | 253 | .322 |  |  |
| Yield - Between groups | 1.711 | 3 | .570 | 1.897 | .131 |
| Yield - s | 76.070 | 253 | .301 |  |  |
| Total Score - Between groups | 1.721 | 3 | .574 | 2.608 | .052 |
| Total Score - s | 55.626 | 253 | .220 |  |  |
| Quality of Life - Physiology - Between groups | 1.166 | 3 | .389 | .853 | .466 |
| Quality of Life - Physiology - s | 115.271 | 253 | .456 |  |  |
| Psychology - Between groups | 3.938 | 3 | 1.313 | 2.944\* | .034 |
| Psychology - s | 112.813 | 253 | .446 |  |  |
| Society - Between groups | .187 | 3 | .062 | .165 | .920 |
| Society - s | 95.695 | 253 | .378 |  |  |
| Surroundings - Between groups | 2.675 | 3 | .892 | 2.490 | .061 |
| Surroundings - s | 90.598 | 253 | .358 |  |  |

Note: \*\* p<.01,\*p<.05

Table 2-28 Analysis of age differences for uncertainty of results

| **Age Group** | **Under 25** | **25-45 years old** | **46-60 years old** | **Over 60 years old** |
| --- | --- | --- | --- | --- |
| Under 25 | 1 | -0.254 | -0.578\* | -0.211 |
| 25-45 years old | -0.254 | 1 | -0.325\* | 0.043 |
| 46-60 years old | -0.578\* | -0.325\* | 1 | 0.367\* |
| Over 60 years old | -0.211 | 0.043 | 0.367\* | 1 |

In the table, the mean differences and significant levels (p-values) of the pairwise comparisons between age groups are shown. The significant levels marked with an asterisk (\*) indicate that the difference is statistically significant at the 0.05 level.

Table 2-29 Analysis of age differences in psychological aspects of quality of life

| **Age Group** | **Under 25** | **25-45 Years Old** | **46-60 Years Old** | **Over 60 Years Old** |
| --- | --- | --- | --- | --- |
| Under 25 | 1 |  |  |  |
| 25-45 Years Old | -.080 | 1 |  |  |
| 46-60 Years Old | .214 | .275 | 1 |  |
| Over 60 Years Old | .024 | .907 | .104 | 1 |

Figure 2-18 Differences in uncertainty about outcomes by age

Figure 2-19 Graph of age differences in psychological aspects of quality of life

### 2.8.3 Psychological leverage, cognitive assessment, coping style and quality of life differences in educational levels

Education level can affect people's perception of events, so the differences in education level of various variables in cancer patients were examined. After analysis of variance, the results showed that there was no significant difference in psychological leverage, cognitive evaluation, coping style and quality of life among the various educational level groups, as shown in Table 2-30.

Table 2-30 Analysis of variance of education level on each variable

| **Variable** | **Source of Variation** | **Sum of Squares** | **Degrees of Freedom** | **Mean Square** | **F-value** | **Significant Level** |
| --- | --- | --- | --- | --- | --- | --- |
| Cognitive Assessment | Between Groups | 2.206 | 3 | .735 | 1.936 | .124\*\* |
| Resilience | Between Groups | 96.098 | 253 | .380 |  |  |
| Positive Evaluation | Between Groups | .229 | 3 | .076 | .159 | .924 |
| Taking Responsibility | Between Groups | .814 | 3 | .271 | .266 | .850 |
| Feeling Threatened | Between Groups | 4.382 | 3 | 1.461 | 1.663 | .175 |
| Uncertainty | Between Groups | 1.065 | 3 | .355 | .346 | .792 |
| Determine How to Deal With Face | Between Groups | 1.301 | 3 | .434 | 1.982 | .117 |
| Avoid | Between Groups | 1.132 | 3 | .377 | 1.184 | .316 |
| Yield | Between Groups | .076 | 3 | .025 | .082 | .970 |
| Total Score | Between Groups | .149 | 3 | .050 | .220 | .882 |
| Quality of Life Physiology | Between Groups | 1.128 | 3 | .043 | .093 | .964 |
| Psychology | Between Groups | 1.806 | 3 | .602 | 1.325 | .267 |
| Society | Between Groups | .353 | 3 | .118 | .312 | .817 |
| Surroundings | Between Groups | 1.044 | 3 | .348 | .955 | .415 |

Note: \*\* p<.01 ,\*p<.05

### 2.8.4 Difference test of psychological leverage, cognitive assessment, coping style and quality of life in knowing the time of illness

Knowing the time of illness can affect the patient's perception of the disease and change the patient's response to the disease, so test the differences of each variable in the time of knowing the illness, the psychological leverage, cognitive evaluation, Means and variances for coping styles and quality of life are shown in Appendix Table 4. The results of variance analysis showed that psychological leverage and quality of life had no difference in knowing the time of illness, taking responsibility, feeling threatened and uncertain evaluation of the disease had no significant difference in knowing the time of illness, positive evaluation, facing the disease. There was a significant difference in the time of illness between coping and succumbing to coping, as shown in Table 2-31.

Table 2-31 shows the variance analysis of each variable by the time of illness

| **Cognitive Assessment** | **Source of Variation** | **Sum of Squares** | **Degrees of Freedom** | **Mean Square** | **F Value** | **Significance Level** |
| --- | --- | --- | --- | --- | --- | --- |
| Resilience | Between Groups | 2.415 | 4 | 0.604 | 1.586 | 0.178 |
| Positive Evaluation | Between Groups | 4.998 | 4 | 1.250 | 2.690\* | 0.032 |
| Take Responsibility | Between Groups | 5.281 | 4 | 1.320 | 1.313 | 0.266 |
| Feel Threatened | Between Groups | 5.771 | 4 | 1.443 | 1.647 | 0.163 |
| Uncertainty on Outcome | Between Groups | 4.643 | 4 | 1.161 | 1.143 | 0.337 |
| Determine how to deal with face | Within Groups | 255.939 | 252 | 1.016 | - | - |
| Face | Between Groups | 2.851 | 4 | 0.713 | 3.336\* | 0.011 |
| Avoid | Between Groups | 2.937 | 4 | 0.734 | 2.349 | 0.055 |
| Yield | Between Groups | 3.056 | 4 | 0.764 | 2.577\* | 0.038 |
| Total Score | Between Groups | 1.929 | 4 | 0.182 | 2.193 | 0.070 |
| Quality of Life Physiology | Between Groups | 2.730 | 4 | 0.682 | 1.512 | 0.199 |
| Psychology | Between Groups | 4.291 | 4 | 1.073 | 2.404 | 0.050 |
| Society | Between Groups | 1.501 | 4 | 0.375 | 1.002 | 0.407 |
| Surroundings | Between Groups | 2.411 | 4 | 0.603 | 1.672 | 0.157 |

Note: \*\* p<.01, \*p<.05

Further test positive evaluation has significant differences in the time of learning the disease, mainly in more than one year, two to four weeks and one to six months, and there is a significant difference in the time of learning of the disease in the face of coping, mainly in half a year There are differences between the above and two to four weeks, one to six months, and more than one year. There is a significant difference in the time of knowing the disease in the succumbing coping, which is mainly manifested in one to six months and more than one year. Show in Table 2-32, 2-33 and Figures 2-20, 2-21.

Table2-32 Difference analysis of positive evaluation in the time of learning the disease

| **Know when you are sick** | **Within a week** | **Two to four weeks** | **One to six months** | **More than half a year** | **More than a year** |
| --- | --- | --- | --- | --- | --- |
| Mean difference | 1 | .107 | .264 | .322 | .542 |
| p-value | - | .7301 | .356 | .274 | .065 |
| Mean difference | - | 1 | .158 | .216 | .435\*\* |
| p-value | - | - | .280 | .183 | .007 |
| Mean difference | - | - | 1 | .058 | .278\* |
| p-value | - | - | - | .611 | .013 |
| Mean difference | - | - | - | 1 | .220 |
| p-value | - | - | - | - | .094 |

Note: \*p<.01, \*p<.05

Table 2-33 Analysis of the differences in the time of knowing the illness when faced with coping

| **Know when you are sick** | **Within a week** | **Two to four weeks** | **One to six months** | **More than half a year** | **More than a year** |
| --- | --- | --- | --- | --- | --- |
| Mean difference |  | 0.101 | 0.161 | 0.386 | 0.115 |
| P-value |  | 0.630 | 0.406 | 0.054 | 0.562 |
| Mean difference | 0.107 | 1 | 0.158 | 0.216 | 0.435\*\* |
| P-value | 0.7301 |  | 0.280 | 0.183 | 0.007 |
| Mean difference | 0.264 | 0.216 | 1 | 0.058 | 0.278\* |
| P-value | 0.356 | 0.183 |  | 0.611 | 0.013 |
| Mean difference | 0.322 | 0.058 | 0.225\*\* | 1 | 0.094 |
| P-value | 0.274 | 0.611 | 0.004 |  | 0.220 |
| Mean difference | 0.542 | 0.435\*\* | 0.278\* | 0.271\*\* | 1 |
| P-value | 0.065 | 0.007 | 0.013 | 0.002 |  |

Note: \*p<.01, \*p<.05

Table2-34 Difference analysis of yielding coping in the time of getting sick

| **Know when you are sick** | **within a week** | **two to four weeks** | **One to six months** | **more than half a year** | **more than a year** |
| --- | --- | --- | --- | --- | --- |
| in a week | 1 |  |  |  |  |
| two to four weeks | 0.033 | 1 |  |  |  |
| One to six months | 0.041 | 0.008 | 1 |  |  |
| more than half a year | -0.131 | -0.164 | -0.172 | 1 |  |
| more than a year | -0.216 | 0.249 | -0.257\*\* | -0.085 | 1 |

Note: \*p<.01, \*p<.05

Figure 2-20 Difference of positive evaluations in the time of learning about illness

Figure 2-21 Differences in the time of learning of illness between facing and yielding coping

### 2.8.5 Difference test of psychological lever, cognitive evaluation, coping style and quality of life in terms of disease types

The type of disease has a great influence on the prognosis of the disease. Breast cancer has a better prognosis and a longer survival time, while digestive tract cancer generally has a poor prognosis and is prone to metastasis. Therefore, each variable is evaluated. Differences in disease types. The mean and variance of psychological levers, cognitive assessments, coping styles, and quality of life in patients with different disease types are shown in Appendix Table 5. The results of analysis of variance showed that psychological leverage, coping style and quality of life and all aspects of quality of life did not differ in terms of disease types. There were no significant differences in the types of diseases in the cognitive evaluation of positive evaluation, feeling threatened and uncertainty about the results, but there were differences in the types of diseases in the cognitive evaluation of responsibility, as shown in Table 2-35.

Table 2-35 disease types of analysis of variance for each variable

| **Source of Variation** | **Sum of Squares** | **Degrees of Freedom** | **Mean Square** | **F Value** | **Significance Level** |
| --- | --- | --- | --- | --- | --- |
| Cognitive Assessment Resilience | Between groups | 1.406 | 5 | .281 | .729 |
|  | Within groups | 96.898 | 251 | .386 |  |
| Positive evaluation | Between groups | 4.382 | 5 | .876 | 1.869 |
|  | Within groups | 117.684 | 251 | .469 |  |
| Take responsibility | Between groups | 14.761 | 5 | 2.952 | 3.038\* |
|  | Within groups | 243.918 | 251 | .972 |  |
| Feel threatened | Between groups | 4.769 | 5 | .954 | 1.080 |
|  | Within groups | 221.779 | 251 | .884 |  |
| Uncertainty (on outcome) | Between groups | 6.283 | 5 | 1.257 | 1.240 |
|  | Within groups | 254.299 | 251 | 1.013 |  |
| Determine how to deal with | Between groups |  | 1.890 | 5 | .378 |
|  | Within groups |  | 54.790 | 251 | .218 |
| Face | Between groups | 1.062 | 5 | .212 | .661 |
|  | Within groups | 80.655 | 251 | .321 |  |
| Avoid | Between groups | 3.171 | 5 | .634 | 2.134 |
|  | Within groups | 74.610 | 251 | .297 |  |
| Yield | Between groups | 1.128 | 5 | .226 | 1.007 |
|  | Within groups | 56.219 | 251 | .224 |  |
| Total Score | Between groups | 2.626 | 5 | .525 | 1.158 |
| (Quality of life) |  | Within groups | 113.811 | 251 | .453 |
| Psychology | Between groups | 3.774 | 5 | .755 | 1.677 |
| (Quality of life) |  | Within groups | 112.977 | 251 | .450 |
| Society | Between groups | 1.244 | 5 | .249 | .660 |
| (Quality of life) |  | Within groups | 94.638 | 251 | .377 |
| Surroundings | Between groups | .687 | 5 | .137 | .373 |
| (Quality of life) |  | Within groups | 92.586 | 251 | .369 |

Note: \*\* p<.01,\*p<.05

For further analysis, the differences in disease types of responsible cognitive evaluations are mainly manifested in breast cancer, digestive tract cancer, respiratory system cancer and other cancer types, as shown in Table 2-36.

Table 2-36 Analysis of the differences in disease types

|  | **Breast Cancer** | **Digestive Tract Cancer** | **Respiratory Cancer** | **Separability Cancer** | **Gynecological Cancer** | **Others** |
| --- | --- | --- | --- | --- | --- | --- |
| Breast Cancer | 1 |  |  |  |  |  |
| Digestive Tract Cancer | -.602\*\* | 1 |  |  |  |  |
| Respiratory Cancer | -.692\*\* | -.090 | 1 |  |  |  |
| Hepatobiliary Cancer | -.641 | -.039 | .051 | 1 |  |  |
| Gynecological Cancer | -.424 | .178 | .269 | .217 | 1 |  |
| Others | -.530\* | .072 | .162 | .111 | -.106 | 1 |

Note: \*\* p < .01."p < .05

### CHAPTER 3

### CONCLUSIONS

This study employed literature review, questionnaire collection, and data analysis to investigate the psychological levers mechanism in the cancer field, aiming to explore the impact of cognitive evaluation and coping style on cancer patients' quality of life. Based on the Lazarus' stress interaction theory, this study identified a model in which psychological levers influence quality of life through cognitive evaluation and coping styles, contributing to the theoretical understanding of psychological levers and providing insights into cancer patients' psychological and behavioral responses to stress.

Quality of life is a crucial indicator of various aspects of cancer patients. Therefore, understanding how patient personality traits, cognitive evaluation, and coping style affect quality of life can provide valuable guidance for doctors, nurses, relatives, and friends to offer targeted support.

While this study surveyed 257 cancer patients, it still has limitations that require further investigation. Firstly, the study was geographically restricted to Hangzhou and Beijing, representing only some areas. Increasing the sample size and expanding the survey area in future research may generate a more comprehensive model. Secondly, the validity of the cognitive evaluation scale used in this study requires further examination, and the cognitive evaluation questionnaire for cancer patients can be improved in subsequent research. Thirdly, the questionnaire method has limitations as cancer patients' moods and physical conditions vary during the survey. Future research should address this issue and improve the survey's accuracy. Finally, while this study revealed that psychological levers primarily affect the physiological aspects of quality of life, the underlying mechanisms for why it does not affect psychological, social, and environmental aspects remain unclear, providing researchers with a potential area for future research.

# SUMMARY

The present study aimed to investigate the impact of psychological and behavioral factors of cancer patients life quality, with a particular focus on the role of psychological leverage, cognitive evaluation, and coping style. Results revealed several important findings that shed light on the complex interplay between these variables.

One of the main contributions of this study is the identification of several issues that need to be addressed in future research on psychological leverage. Specifically, the definition of psychological leverage remains unclear, and there is a need for a more comprehensive framework that takes into account individual cognitive factors. Moreover, most studies on psychological leverage have focused on children, and more research is needed to investigate its impact on adults.

In terms of the impact of psychological and behavioral factors on quality of life, the present study found that most cancer patients reported being satisfied with their quality of life, with positive cognitive evaluations and coping styles being more prominent than negative aspects. This highlights the importance of fostering positive psychological states and coping strategies in cancer patients.

The study also revealed that psychological leverage can impact coping style through cognitive evaluation, with submissive coping being influenced by positive evaluations and uncertain evaluations of outcomes. Coping style, in turn, played a partial mediating role between cognitive evaluation and quality of life, while cognitive assessment played a partial mediating role between psychological leverage and quality of life. These findings emphasize the importance of considering both cognitive and behavioral factors in the study of psychological leverage and quality of life in cancer patients.

In addition, the study found that demographic variables such as gender, age, and type of disease can have an impact on cognitive evaluation, coping style, and quality of life. Notably, gender was found to have a significant effect on avoidance coping, with males exhibiting higher avoidance coping scores than females. Age was found to impact the uncertainty of outcome and the psychological aspects of quality of life, while the duration of illness affected positive evaluations, confrontational coping, and submissive coping. Finally, the type of disease had an impact on the patient's assessment of responsibility.

Based on the results of the study, two models were developed to help explain the relationship between psychological leverage, cognitive evaluation, coping style, and quality of life in cancer patients. The first model suggested that psychological leverage impacts submissive coping through positive evaluation and uncertainty about the outcome, ultimately affecting overall quality of life. The second model suggested that psychological leverage impacts the psychological aspects of quality of life, with uncertainty about outcomes also directly impacting the physiological aspects of quality of life.

In conclusion, this study provides important insights into the complex interplay between psychological and behavioral factors in the quality of life of cancer patients. Future research should continue to explore the role of psychological leverage and develop a more comprehensive framework for its study. Moreover, interventions aimed at fostering positive psychological states and coping strategies may be effective in improving the quality of life of cancer patients.

**REFERENCES**

1.Ahmad MM, Musil CM, Jones JA. Prostate cancer: appraisal, coping, and health status. Journal of Gerontological Nursing, 2005. 456 p.

2. Ali NS, Khalil HZ. Identification of stressors, level of stress, coping strategies and coping effectiveness among Egyptian mastectomy patients. Cancer Nursing, 2011. 156p.

3. Antoni MH, Goodkin K. Host moderator variables in the promotion of cervical neoplasia -- 1. personal sides. Journal of Psychosomatic Research, 2018. 126-128 p.

4.Arehart-Treichel J. Resilience Shown in Youth Protects Against Adult Stress. Psychiatry News, 2005. 123 p.

5. Baron DL. A model to predict negative health outcomes during cancer treatment. Indiana University, 2002. 99-100 p.

6.Beardsiee WR, Podoref sky D. Resilient adolescents whose parents have serious affective and other psychiatric disorders: Importance of self-understanding and relationships. American Journal of Psychiatry, 2008. 156 p.

7. Block J, Kremen AM. IQ and ego-resiliency: Conceptual and empirical connections and separateness. Journal of Personality and Social Psychology, 2006. 111 p.

8. Burgess ES, Haaga DA. Appraisals, Coping Responses, and Attributions as Predictors of individual Differences in Negative Emotions Among Pediatric Cancer Patients. Cognitive Therapy and Research. 1998. 468 p.

9. Coutu DL. How resilience works. Harvard Business Review, 2002.

10. Connor KM, Davidson JR. Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). Depression and Anxiety, 2003. 56p.

11. Carver C, Pozo C, Harris SD. How coping mediated the effect of optimism distress: a study of women with early-stage breast cancer. Journal of Perspective Socio-Psychology, 2013. 30 p.

12. Coulter L. Optimism, coping, and psychological well-being among people with advanced lung cancer. Dalhousie University, 2019. 145-146 p.

13. Diane R, Zacharias A, Cheryl A. Quality of life and coping in patients with gynecologic cancer and their spouse. Oncology Nursing Forum, 2004. 53 p.

14.Endler NS, Parker JD. Multidimensional assessment of coping: A critical evaluation. Journal of Personality and Social Psychology, 2000. 144 p.

15. Ferguson E, Cox T. The functional dimensions of coping scale: Theory, reliability, and validity. British Journal of Health Psychology, 2017. 53-59 p.

16. Fine SB. Resilience and human adaptability: Who rises above adversity? American Journal of Occupational Therapy, 2001. 33 p.

17.Flach FF. Psychobiologic resilience, psychotherapy, and the creative process. Comprehensive Psychiatry, 2016. 60-70 p.

18.Fredette SL. Breast cancer survivors: Concerns and coping. Cancer Nursing, 2015. 56 p.

19. Fredrickson BL, Tugade MM, Waugh CE. What good are positive emotions in crises? A prospective study of resilience and emotions following the terrorist attacks on the United States on September 11th, 2001. Journal of Personality and Social Psychology, 2013.

20. Frieze, I. H., &Bookwala, J. Coping with Unusual Stressors: Criminal Victimization. In M. Zeidner& N. S. Endler (Eds.), Handbook of Coping: Theory, Research, Application (pp. 77-93). New York: Wiley, 1996.

21.Furnham, A., Crump, J., & Whelan, J. Validating the NEO personality inventory using assessor's ratings. Personality and Individual Differences, 2000, 29(2), 222-232.

22.Garmezy, N. Children in poverty: Resilience despite risk. Psychiatry, 1993, 56(2), 127-136.

23.Haase, J. E. The adolescent resilience model as a guide to interventions. Journal of Pediatric Oncology Nursing, 2004, 21(5), 289-299.

24. Halstead, M. T., &Fernsler, J. L. Coping strategies of long-term cancer survivors. Cancer Nursing, 2005, 28(1), 58-66.

25.Hamama-Raz, Y., Solomon, Z., &Schachter, J. Objective and subjective stressors and the psychological adjustment of melanoma survivors. Psycho-Oncology, 2005, 14(4), 255-268.

26.Hechtman, L. Resilience and vulnerability in long-term outcome of attention deficit hyperactive disorder. Journal of Child Psychology and Psychiatry, 1993, 34(4), 585-604.

27. http://www.squ.edu.om/mj/Archive/Oct\_00/kuwait/

28. American Psychological Association. Understanding Resilience. Retrieved from http://www.apa.org/helpcenter/road-resilience.aspx

29. Hunter, A. J., & Chandler, G. E. Adolescent resilience. Journal of Nursing Scholarship, 1999, 31(3), 243-248.

30. Lazarus, R. S., &Folkman, S. Stress, Appraisal, and Coping. New York: Springer Publishing Company, 1984.

31.Luthans, F., Avolio, B. J., & Walumbwa, F. O. The Psychological Capital of Chinese Workers: Exploring the Relationship with Performance. Management and Organization Review, 2005, 1(2), 249-271.

32.Rabkin, J. G., Remien, R., &Katoff, L. Resilience in adversity among long-term survivors of AIDS. Hospital and Community Psychiatry, 1993, 44(2), 162-167.

33.Fawzy, F. I., Lavery, B. A., & Valentine, A. Causal attributions, coping strategies, and adjustment to breast cancer. Cancer Nursing, 1990, 13(2), 82-87.

34. Krause, K. Coping with cancer. Western Journal of Nursing Research, 1991, 13(1), 34-49.

35. Larsen, R. J., &Ketelaar, T. Personality and susceptibility to positive and negative emotional states. Journal of Personality and Social Psychology, 1991, 61(1), 132-140.

36. Lev, E.L. (2012). Patients' strategies for adapting to cancer treatment. Western Journal of Nursing Research, 36, pp. -

37. Liu, G. (2002). Measurement of quality of life. Foreign Medicine. Sociology Volume, 14-18.

38. Li, Y., & Zhang, M. (2004). Analysis of emotional disorders and coping styles in cancer patients at various stages. Chinese Journal of Clinical Psychology, 12, pp. 222.

39.Luthar, S.S., Cicchetti, D., & Becker, B. (2010). The Construct of resilience: A Critical Evaluation and Guidelines for Future Work. Child Development, 71, pp. 543-562.

40.Luthans, F. (2018). The need for and meaning of positive organizational behavior. Journal of Organizational Behavior, 23, pp. 695-706.

41.Neises, M., Nebe, T., & Schiller, A. (2015). Coping with illness/quality of life and immunologic parameters of patients with breast carcinoma and benign tumors. GynakolGeburtshelfRadsch, 44, pp. 143-150.

42.Mandleco, B.L., & Peery, J.C. (2000). An organizational framework for conceptualizing resilience in children. Journal of Child and Adolescent Psychiatric Nursing, 13, pp. 99-108.

43.Masten, A., Best, K., &Garmezy, N. (2000). Resilience, and development: Contributions from the study of children who overcome adversity. Development and Psychopathology, 12, pp. 425-444.

44.Mishel, M.H., & Sorenson, D.S. (2001). Uncertainty in gynecological cancer: a test of mediating functions of ability and coping. Nursing Research, 50, pp. 332-338.

45.Oisson, C.A., Bond, L., & Burns, J.M. (2013). Adolescent resilience: a concept analysis. Journal of Adolescence, 36, pp. 983-991.

46.Orley, J., &Kuyken, W. (2005). Quality of life assessment: International perspectives. Quality of Life Research, 4, pp. 77-84.

47. Resnick, M.D., Bearman, P.S., & Blum, R.W. (2017). Protecting adolescents from harm: Finding from the national longitudinal study on adolescent health. Journal of the American Medical Association, 278, pp. 236-240.

48. Richardson, G.E. (2020). The metatheory of resilience and resiliency. Journal of Clinical Psychology, 56, pp. 485-497.

49.Rickwood, R.R., Robert, J., & Batten, S. (2015). Empowering high-risk clients to attain a better quality of life: a career resiliency framework. Journal of Employment Counseling, 52, pp. 123-135.

50. Rutter, M. (2017). Psychosocial resilience and protective mechanisms. American Journal of Orthopsychiatry, 57, pp. 316-331.

51. Rutter, M. (2000). Resilience concepts and findings: Implications for family therapy. Journal of Family Therapy, 22, pp. 60-77.

52.Chaiyachati, S. Relationships among optimism, cognitive appraisal, coping strategies, and psychosocial adjustment in Thai women newly diagnosed with breast cancer. Case Western Reserve University. 2019. 142 p.

53. Seattle, WA, Levy, D. Beyond bouncing back: The concept of organizational resilience. The annual meeting of the Academy of Management, 1994.

54. Sheila, A., Payne, B. A. Coping with palliative chemotherapy. Journal of Advanced Nursing, 2019, 56-57 p.

55. Stewart, M., Reid, G., Mangham, C. Fostering children's resilience. Journal of Pediatric Nursing, 1997.

56. Terry, D. J., Hynes, G. J. Adjustment to a low-control situation: Reexamining the role of coping responses. Journal of Personality and Social Psychology, 2008, 22-26 p.

57.Testa, M. A., Simonson, D. C. Assessment of quality-of-life outcomes. New England Journal of Medicine, 2006, 123p.

58.Tugade, M. M., Fredrickson, B. L. Resilient individuals use positive emotions to bounce back from negative emotional experiences. Journal of Personality and Social Psychology, 2014.

59.Wagnild, G., Young, H. M. Development and psychometric evaluation of the Resilience Scale. Journal of Nursing Measurement, 1993.

60.Wagnild, G., Young, H. M. Development and psychometric evaluation of the Resilience Scale. Journal of Nursing Measurement, 2003, 11(3), 165-178.

61. Wang, Y. Q. Coping of Chinese women with gynecologic cancer. Chiangmai University, 2017, 169-170 p.

62. Werner, E. E. Children of the Garden Island. Scientific American, 1989.

63. Werner, E. E. Resilience in Development. American Psychological Society, 2005, 156 p.

64.Wolin, S., Wolin, J. The resilience self: How survivors of troubled families rise above adversity. New York: Villard Books, 2013, 111 p.

65. Yi, J. P., Smith, R. E., Vitaliano, P. E. Stress-resilience, illness, and coping: A person-focused investigation of young women athletes. Journal of Behavioral Medicine, 2005, 28(5), 367-377.

66. Zhu, L., Jiang, G., Zhu, Y., et al. Research on the coping characteristics of cancer patients. Chinese Behavioral Medicine Science, 2010, 19(2), 123-126.

# Appendix 1 Descriptive Analysis Table for Demographic Variables

Table 1 Mean and standard deviation of psychological leverage, cognitive assessment, coping style and quality of life in patients of different genders

Male (n=118) Female (n=139)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | M | SD | M | SD |
| Cognitive evaluation | psychological leverage | 2.936 | .648 | 2.801 | .589 |
| positive evaluation | 4.336 | .557 | 4.287 | .787 |
| take responsibility | 3.953 | .980 | 3.755 | 1.020 |
| feel threatened | 2.421 | .946 | 2.2680 | .933 |
| Uncertainty about results | 3.111 | .992 | 3.1295 | 1.026 |
| Solution | face | 2.523 | .482 | 2.4440 | .458 |
| avoid | 2.339 | .548 | 2.4910 | .571 |
| yield | 1.742 | .547 | 1.7612 | .555 |
| Quality of Life | total score | 3.274 | .469 | 3.2695 | .477 |
| physiological | 3.341 | .657 | 3.1859 | .682 |
| psychology | 3.235 | .689 | 3.3266 | .662 |
| society | 3.579 | .607 | 3.6859 | .613 |
| surroundings | 3.192 | .636 | 3.2314 | .576 |

Table 2 Mean and variance of psychological leverage, cognitive assessment, coping style and quality of life in patients of different ages.

<25(n=13) 25-45(n=62) 46-60(n=117) >60(n=66)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | M | SD | M | SD | M | SD | M | SD |
| Cognitive evaluation | psychological leverage | 2.733 | .732 | 2.871 | .492 | 2.781 | .618 | 3.029 | .681 |
| positive evaluation | 4.403 | .641 | 4.422 | .548 | 4.427 | .7270 | 4.299 | .748 |
| take responsibility | 3.846 | .898 | 3.885 | 1.085 | 3.854 | 1.012 | 3.795 | .952 |
| feel threatened | 1.923 | 1.027 | 2.282 | .915 | 2.423 | .904 | 2.322 | 1.002 |
| Uncertainty about results | 2.743 | .936 | 2.997 | .959 | 3.321 | .935 | 2.954 | 1.137 |
| Solution | face | 2.483 | .607 | 2.501 | .455 | 2.493 | .492 | 2.437 | .419 |
| avoid | 2.519 | .624 | 2.442 | .565 | 2.397 | .566 | 2.424 | .559 |
| yield | 1.723 | .443 | 1.672 | .532 | 1.841 | .572 | 1.675 | .536 |
| Quality of Life | total score | 3.258 | .536 | 3.352 | .505 | 3.184 | .468 | 3.353 | .418 |
| physiological | 3.243 | .705 | 3.314 | .721 | 3.186 | .674 | 3.333 | .624 |
| psychology | 3.369 | .570 | 3.449 | .723 | 3.155 | .700 | 3.345 | .563 |
| society | 3.615 | .730 | 3.666 | .632 | 3.609 | .627 | 3.661 | .550 |
| surroundings | 3.038 | .577 | 3.316 | .552 | 3.122 | .644 | 3.313 | .555 |

Table 3 Mean and variance of psychological leverage, cognitive assessment, coping style and quality of life in patients with different educational levels.

Junior high school and below technical secondary school or high school junior college or undergraduate graduate and above

(n=54) (n=89) (n=104) (n=10)

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | M | SD | M | SD | M | SD | M | SD |
| Cognitive evaluation | psychological leverage | 2.891 | .654 | 2.841 | .525 | 2.826 | .657 | 3.307 | .709 |
| positive evaluation | 4.361 | .617 | 4.280 | .755 | 4.312 | .697 | 4.275 | .380 |
| take responsibility | 3.976 | 1.021 | 3.797 | 1.119 | 3.913 | .879 | 3.850 | 1.179 |
| feel threatened | 2.263 | .884 | 2.323 | .943 | 2.329 | .963 | 2.975 | .869 |
| Uncertainty about results | 3.101 | .900 | 3.607 | 1.056 | 3.152 | 1.025 | 3.383 | 1.051 |
| Solution | face | 2.391 | .525 | 2.573 | .470 | 2.451 | .445 | 2.428 | .308 |
| avoid | 2.458 | .611 | 2.365 | .576 | 2.423 | .519 | 2.700 | .643 |
| yield | 1.740 | .526 | 1.764 | .581 | 1.742 | .547 | 1.820 | .520 |
| Quality of Life | total score | 3.313 | .496 | 3.274 | .501 | 3.250 | .451 | 3.245 | .327 |
| physiological | 3.284 | .708 | 3.265 | .694 | 3.232 | .654 | 3.300 | .592 |
| psychology | 3.325 | .652 | 3.375 | .735 | 3.201 | .638 | 3.120 | .551 |
| society | 3.635 | .580 | 3.662 | .671 | 3.631 | .594 | 3.466 | .421 |
| surroundings | 3.271 | .583 | 3.127 | .675 | 3.248 | .551 | 3.300 | .559 |

Table 4 Mean and variance of psychological leverage, cognitive assessment, coping style, and quality of life in patients with different time of illness.

Two to four weeks within one week One to six months More than half a year More than one year

(n=6) (n=27) (n=115) (n=52) (n=57)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | M | SD | M | SD | M | SD | M | SD | M | SD |
| Cognitive evaluation | psychological leverage | 3.294 | .454 | 2.943 | .561 | 2.904 | .632 | 2.741 | .637 | 2.811 | .601 |
| positive evaluation | 4.625 | .493 | 4.518 | .485 | 4.360 | .673 | 4.302 | .646 | 4.083 | .810 |
| take responsibility | 3.916 | 1.068 | 3.814 | 1.020 | 3.956 | .944 | 3.576 | 1.197 | 3.877 | .902 |
| feel threatened | 3.083 | .846 | 2.370 | .944 | 2.400 | .926 | 2.149 | 1.003 | 2.293 | .894 |
| Uncertainty about results | 3.083 | 1.124 | 3.092 | 1.071 | 3.026 | .953 | 3.080 | .957 | 3.368 | 1.113 |
| Solution | face | 2.666 | .610 | 2.566 | .442 | 2.505 | .449 | 2.280 | .469 | 2.551 | .474 |
| avoid | 2.916 | .516 | 2.379 | .597 | 2.430 | .549 | 2.278 | .617 | 2.500 | .504 |
| yield | 1.700 | .451 | 1.666 | .562 | 1.659 | .501 | 1.830 | .536 | 1.915 | .629 |
| Quality of Life | total score | 3.057 | .357 | 3.282 | .488 | 3.343 | .428 | 3.212 | .477 | 3.151 | .533 |
| physiological | 3.138 | .531 | 3.271 | .719 | 3.336 | .644 | 3.288 | .631 | 3.076 | .745 |
| psychology | 3.800 | .789 | 3.155 | .734 | 3.382 | .578 | 3.211 | .768 | 3.161 | .695 |
| society | 3.944 | .646 | 3.753 | .543 | 3.658 | .589 | 3.557 | .632 | 3.578 | .662 |
| surroundings | 3.611 | .250 | 3.246 | .574 | 3.272 | .579 | 3.089 | .725 | 3.149 | .548 |

Table 5 Mean and variance of psychological leverage, cognitive assessment, coping style and quality of life in patients with different disease types.

Breast Cancer Digestive Tract Cancer Respiratory System Cancer Separability System Cancer Gynecological System Cancer Others

(n=46) (n=76) (n=59) (n=8) (n=23) (n=45)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | M | SD | M | SD | M | SD | M | SD | M | SD | M | SD |
| Cognitive evaluation | psychological leverage | 2.739 | .527 | 2.874 | .694 | 2.916 | .629 | 3.096 | .449 | 2.913 | .386 | 2.837 | .683 |
| positive evaluation | 4.152 | .848 | 4.421 | .570 | 4.377 | .553 | 3.812 | .923 | 4.326 | .799 | 4.277 | .723 |
| take responsibility | 3.358 | 1.181 | 3.960 | .954 | 4.050 | .893 | 4.000 | .755 | 3.872 | 1.126 | 3.888 | .884 |
| feel threatened | 2.342 | .965 | 2.292 | .930 | 2.529 | 1.048 | 2.625 | .481 | 2.271 | .925 | 2.144 | .835 |
| Uncertainty about results | 3.231 | 1.088 | 2.995 | 1.008 | 3.251 | .898 | 3.145 | 1.203 | 2.760 | 1.088 | 3.229 | .973 |
| Solution | face | 2.391 | .491 | 2.586 | .455 | 2.416 | .473 | 2.678 | .399 | 2.409 | .314 | 2.476 | .530 |
| avoid | 2.391 | .491 | 2.384 | .576 | 2.428 | .506 | 2.406 | .516 | 2.619 | .499 | 2.405 | .596 |
| yield | 1.900 | .643 | 1.618 | .509 | 1.779 | .547 | 2.025 | .433 | 1.678 | .590 | 1.782 | .480 |
| Quality of Life | total score | 3.185 | .539 | 3.294 | .436 | 3.282 | .480 | 3.309 | .460 | 3.385 | .431 | 3.289 | .473 |
| physiological | 3.173 | .780 | 3.239 | .626 | 3.372 | .641 | 2.854 | .726 | 3.347 | .708 | 3.248 | .646 |
| psychology | 3.147 | .560 | 3.339 | .663 | 3.196 | .787 | 3.000 | .676 | 3.504 | .634 | 3.386 | .635 |
| society | 3.543 | .593 | 3.592 | .645 | 3.711 | .595 | 3.583 | .556 | 3.753 | .733 | 3.659 | .514 |
| surroundings | 3.199 | .645 | 3.263 | .545 | 3.138 | .635 | 3.250 | .445 | 3.289 | .711 | 3.196 | .593 |

# Appendix 2 Questionnaire for the study

Questionnaire

The purpose of this study was to investigate the impact of patient personality characteristics on quality of life, to supply a scientific basis for further research and practice.

This research is anonymous and will not cause any harm to you. The results of the research will have great benefits for patients to supply mental health services, and the information obtained from the research will be confidential. Whether you take part in this research will not affect your medical care and health care. any impact on nursing services.

We look forward to your participation. thanks!

The following is the questionnaire part, there are 4 parts in total, please answer all the questions. If you are not sure about an answer to a question, please choose the answer that best fits, usually the one that comes to your mind first.

Part 1: This part is to measure your usual state, please mark √ on the corresponding number according to your usual reaction.

Not applicable at all, little use, some applicable, very applicable

1. I am generous to my friends 1 2 3 4

2. In the face of shock, I can quickly recover 1 2 3 4

3. I like to deal with new and unusual situations 1 2 3 4

4. I often have a good impression in people's minds 1 2 3 4

5. I am considered a very energetic person 1 2 3 4

6. I like to take different paths to familiar places 1 2 3 4

7. I am more curious than others 1 2 3 4

8. Most of the people I've met are cute 1 2 3 4

9. I often think carefully before doing something 1 2 3 4

10. I like to challenge new and difficult things 1 2 3 4

11. My daily life is full of things that interest me 1 2 3 4

12. I like to think of myself as having a very strong personality 1 2 3 4

13. I recover quickly from anger 1 2 3 4

Part 2: This part is to measure how you evaluated the disease when you first learned about the disease. Please mark √ on the corresponding number according to your true thoughts.

Completely incompatible Comparatively incompatibleIndeterminateComparativeComparableComparativeComparative

1. This illness has made me feel that I have lost respect from others 1 2 3 4 5

2. I feel threatened by disease 1 2 3 4 5

3. I feel that I cannot tolerate this illness 1 2 3 4 5

4. Because of this illness, I may not be able to do my previous job 1 2 3 4 5

5. I feel responsible for participating in therapy 1 2 3 4 5

6. This illness has made me feel unable to achieve my ideals 1 2 3 4 5

7. I don't know what kind of ending I will face 1 2 3 4 5

8. This illness has made me feel unable to meet my expectations 1 2 3 4 5

9. I feel some responsibility for this illness 1 2 3 4 5

10. I feel I have some responsibility for this illness 1 2 3 4 5

11. I feel a lack of control over this illness 1 2 3 4 5

12. I feel that my disease may develop for the better 1 2 3 4 5

13. I feel that this disease can give me some medical knowledge 1 2 3 4 5

14. I feel that my condition can be controlled with treatment 1 2 3 4 5

15. I feel that this illness has given me a lot of attention 1 2 3 4 5

16. I don't know what the outcome of my illness will be 1 2 3 4 5

Part 3: This part is to measure how you dealt with the disease after learning about the disease. Please mark √ on the corresponding number according to your real behavior.

1. Would you like yourself to be involved in making various treatment decisions?

(l) very hopeful (2) moderately hopeful (3) somewhat hopeful (4) not hopeful

2. Do you often talk to relatives and friends about your illness?

(1) never (2) sometimes (3) often (4) always

3. Do you often feel like you have no hope of getting back to full health?

(1) always (2) often (3) sometimes (4) never

4. How much knowledge have you learned about the disease from doctors, nurses, etc. in the past few months?

(1) truly little (2) some (3) more (4) a lot

5. Do you often feel that because of illness, you don't care about all aspects of the future?

(1) never (2) sometimes (3) often (4) always

6. Do you often talk to your relatives and friends about things other than illness because you don't think it is necessary to think about illness in old age?

(1) never (2) sometimes (3) often (4) always

7. When thinking about your illness, do you do anything else to distract yourself?

(1) always (2) often (3) sometimes (4) never

8. Do you often ask your doctor what to do about your disease?

(1) always (2) often (3) sometimes (4) never

9. Do you often feel that you are about to succumb to illness?

(1) always (2) often (3) sometimes (4) never

10. To what extent do you want to forget about your illness?

(1) very low (2) certain (3) quite (4) very large

11. How many questions have you asked your doctor about your illness?

(1) none (2) some (3) more (4) a lot

12. When you meet someone with the same disease, how much detail do you usually talk to him about the disease?

(1) very little (2) some (3) more (4) a lot

13. Do you often distract yourself from the disease by watching movies, TV, etc.?

(1) never (2) sometimes (3) often (4) always

14. Do you often feel that you are powerless against the disease?

(1) always (2) often (3) sometimes (4) never

Part 4: In this part, please review, what has changed in your quality of life after you got sick and before you got sick, please draw √ on the corresponding numbers according to your real situation after getting sick

1. Overall, how would you rate your quality of life?

(l) very bad (2) bad (3) moderately good (4) good (5) very good

2. Overall, are you satisfied with your health?

(1) Very dissatisfied (2) Dissatisfied (3) Moderately satisfied (4) Satisfied (5) Very satisfied

3. Do you enjoy life?

(1) did not enjoy it at all (2) enjoyed it a little (3) enjoyed it moderately (4) enjoyed it very much (5) enjoyed it very much

4. Do you think your life has meaning?

(1) Not at all (2) Somewhat (3) Moderately (4) Very (5) Extremely

5. How good is your ability to concentrate?

(1) Not at all (2) Slightly good (3) Moderately good (4) Very good (5) Excellent

6. Do you feel safe in your daily life?

(1) Not at all safe (2) Slightly safe (3) Moderately safe (4) Very safe (5) Very safe

7. Is your environment healthy? (e.g., pollution, noise, climate, landscape)

(1) Not at all healthy (2) Healthy (3) Moderately healthy (4) Very healthy (5) Very healthy

8. Do you have enough energy in your daily life?

It has to be in the way like this

(1) Not enough at all (2) A little enough (3) Moderately enough (4) Very enough (5) Completely enough

9. Can you accept your appearance?

(l) Not at all (2) Slightly capable (3) Moderately capable (4) Very capable (5) Completely capable

10. Do you have enough money to meet your needs?

(1) Not enough at all (2) A little enough (3) Moderately enough (4) Very enough (5) Completely enough

11. Can you easily get the information you need for your daily life?

(1) Completely inconvenient (2) Slightly convenient (3) Moderately convenient (4) Very convenient (5) Completely convenient

12. How good is your ability to move around?

(1) Not at all (2) Slightly good (3) Moderately good (4) Very good (5) Excellent

13. Are you satisfied with your sleep status?

(1) Very dissatisfied (2) Dissatisfied (3) Moderately satisfied (4) Very satisfied (5) Very satisfied

14. Are you satisfied with your ability to carry out your daily activities?

(l) Very dissatisfied (2) Dissatisfied (3) Moderately satisfied (4) Very satisfied (5) Very satisfied

15. Are you satisfied with your work ability?

(1) Very dissatisfied (2) Dissatisfied (3) Moderately satisfied (4) Very satisfied (5) Very satisfied

16. Are you satisfied with yourself?

(l) Very dissatisfied (2) Dissatisfied (3) Moderately satisfied (4) Very satisfied (5) Very satisfied

17. Are you satisfied with your relationships?

(1) Very dissatisfied (2) Dissatisfied (3) Moderately satisfied (4) Very satisfied (5) Very satisfied

18. Are you satisfied with your sex life?

(l) Very dissatisfied (2) Dissatisfied (3) Moderately satisfied (4) Very satisfied (5) Very satisfied

19. Are you satisfied with the support your friends have given you?

(1) Very dissatisfied (2) Dissatisfied (3) Moderately satisfied (4) Very satisfied (5) Very satisfied

20. Are you satisfied with the condition of your residence?

(1) Very dissatisfied (2) Dissatisfied (3) Moderately satisfied (4) Very satisfied (5) Very satisfied

21. Are you satisfied with the mode of transportation used?

(l) Very dissatisfied (2) Dissatisfied (3) Moderately satisfied (4) Very satisfied (5) Very satisfied

22. Do you often have negative feelings? (Such as sadness, tension, anxiety, depression, etc.)

(1) never (2) infrequently (3) half and half not (4) very often (5) always

Personal Information Section:

Gender: A. Male B. Female

Age: A. Under 25 years oldB.25 - 5 years oldC.46 - 60 years oldD. Over 60 years old

Education level: A. Junior high school and belowB. Secondary school or high schoolC. College or undergraduateD. Graduate and above

How long has it been since you learned of the disease?

A. within a weekB. Two to four weeksC One to six monthsD. More than half a yearE more than one year

Is your disease one of the following?

A. Breast cancer

B. Gastrointestinal cancer (stomach cancer, bowel cancer, esophageal cancer)

C. Respiratory system cancer (lung cancer)

D. Cancer of the separability system (liver cancer, gallbladder cancer, pancreatic cancer)

E. Gynecological system cancer (uterine cancer, cervical cancer, adrenal cancer)

F. Others (osteoarthritis, lymphoma, kidney cancer, melanoma, vascular cancer, pharyngeal cancer)