ISSN 2522-6398 Vol. 6, Issue 1: 107-112, DOI: 10.25236/FER.2023.060117

Construction and analysis of life education evaluation index system for college students

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Abstract: *Constructing the life education evaluation index system is an important measure to enhance the life education of college students and prevent the extreme events caused by the lack of life education. This paper uses literature research, rooted theory qualitative research and Delphi expert consultation methods, Construct a three-level index system of college students' life education evaluation, Including 3 first-level indicators, 6 second-level indicators, 18 third-level indicators, The Cronbach's α coefficient of the total table was 0.866, The content validity index CVI was 0.818, Good reliability and validity; Then the entropy weight method, The results showed that healthy living behavior (20.4%) and negative behavior avoidance (18.8%) were more heavily weighted in the secondary indicators, Consistent with the life education concept; The Pearson correlation coefficient matrix is also plotted, Analysis the correlation between the indicators, And take "self-harm or suicidal behavior" as the observation index, The positive and negative correlation between other indicators was analyzed. The comprehensive analysis results show that the evaluation index system of life education constructed in this study is highly scientific and reliable, and can provide basis for carrying out life education and evaluation education effect in colleges and universities.*

Keywords: *College students, Life education, Grounded theory, Delphi method, Correlation coefficient matrix*

1. Introduction

The core content of life education is to explain the life phenomenon, and understand the process and essence of life [1]. In recent years, the frequency of college students' self-destructive behavior, suicide, sudden death and other incidents has had an important impact on campus security and stability [2]. The lack of life education is alarming [3], which also puts forward a rigid demand for high-quality life education for college students [4]. On the one hand, domestic research on college students' life education mainly focuses on education mechanism discussion, model construction and path innovation [5-7], on the other hand, it mainly focuses on specific situations such as crime and suicide [8-10]. At present, there is a lack of research on the evaluation index system of life education that combines qualitative and quantitative methods, and is based on data with multiple factors and multiple indicators. Therefore, this study combines grounded theory with correspondence survey, qualitative research with quantitative research, and constructs the evaluation index system of college students' life education, and calculates weight coefficients, and conducts correlation analysis, with a view to providing measurement tools and evaluation reference for college students' life education.

2. Objects and Methods

2.1 Preliminary frame of indicator system

The qualitative research method of grounded theory is selected to preliminarily draw up the indicator system. By screening and analyzing 20 typical cases of college students' suicide and self-mutilation through public information such as the Health Times and the China Judgment Document Network, the conceptualization, coding and decoding were carried out with grounded theory, and the related concepts of life education were obtained. After the analysis of saturation test, spindle decoding and selective decoding, the three-level index system of college students' life education evaluation is preliminarily

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arranged.

2.2 Improvement and screening of indicator system

2.2.1. Compile the Delphi method consultation questionnaire

This research adopts the Delphi method of correspondence survey. The questionnaire is divided into four parts. Firstly, the research description, which briefly discusses the background, purpose and significance of carrying out the research on college students' life education; The second is the description of the indicator system, which introduces the foundation and overall distribution of the three-level indicator system; The third is to evaluate and score the indicators one by one based on the Likert 5-level scale; Fourthly, the experts are required to put forward suggestions on the modification of indicators with scores less than 4, and evaluate the rationality of the system framework setting.

2.2.2. Expert re-consultation and amendment

Two rounds of expert consultation were carried out, with 20 questionnaires distributed and returned. After the first round of consultation, the indexes with the average value of experts' scores<4 and coefficient of variation>0.2 were modified or deleted. In the second round of questionnaire, the modified indicator system was evaluated, and whether the expert opinions in the first round were adopted was explained. After the second round of consultation, the evaluation index system of college students' life education was determined, including 3 first level indicators, 6 second level indicators and 18 third level indicators.

2.3 Quality Control

The cases analyzed in the grounded theory are reported by the Supreme People's Court of the People's Republic of China Judicial Document Network and the official media, ensuring the reliability of information sources; The investigators have all received professional theoretical learning and systematic training; Two researchers were responsible for double entry and verification of data.

2.4 Statistical Analysis

Establish database with Epi Data 3.1 software, write data and correct errors; SPSS 26.0 was used for statistical analysis; The split-half reliability coefficient and Cronbach's α Coefficient and the content validity index CVI and other reference indicators were used to test the reliability and validity of the scale; Cronbach's of the total amount table α coefficient > 0.7 and content validity index CVI > 0.8 are taken as the criteria for good reliability and validity.

2.5 Weight calculation and correlation analysis

During the selection of weight calculation methods, the advantages and disadvantages of various weighting methods were fully considered, and the widely used entropy weight method was selected to calculate the weight of the indicator system, so as to avoid the subjective randomness of weighting [11]; At the same time, Pearson correlation coefficient matrix was drawn to analyze the correlation and positive and negative correlation among the indicators.

3. Results

3.1 Basic information of experts

A total of 20 experts participated in the consultation, from three professional and technical fields of education and teaching (9 people), medical and health (7 people) and social affairs management (4 people), ranging in age from 30 to 65 years old, all with master's degree or above. 6 with intermediate professional titles, 14 with senior professional titles, and rich theoretical knowledge and practical experience. See Table 1 for details.

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Table 1: Basic information of experts inquired by letter

project	distribution	Group size	constituent ratio（%)
Gender	Male	10	50
	Female	10	50
Age	30～40	9	45
	40～50	7	35
	50～65	4	20
Specialized field	Education	9	45
	Health services	7	35
	Social affairs management	4	20
Professional title	Middle title	6	30
	Vice-senior title	6	30
	Senior title	8	40

3.2 Index system construction

3.2.1. Preliminary frame of index system

Table 2: Open decoding analysis of some cases

No.	Overview of typical cases	Conceptualization		Categorization
		Basic information	Essential factors	
1	"The poisoning case of a university in Shanghai". In April 2013, Huang, a graduate student of a university in Shanghai, died after being poisoned by his roommate. Analysis: daily trifles; interpersonal relationship; the students can't keep the basic bottom line of human nature; the student didn't understand the meaning of life	Post-graduates Poisoning	Ignore life; Lack of interpersonal skills; Strong learning ability, but no right value pursuit	Cherish life; Love others and love yourself; Scientific outlook on life; Respect others' lives; Commit suicide
2	"The case of Yao from a university in Xi'an". In August 2010, Yao knocked Zhang down while driving and stabbed him to death. Analysis: Suffering from childhood; Evading responsibility and refusing to rescue; Cherish the life of others and cherish your own life; Disregard for life	Under -graduate killing	Ignore life; Not stay in calm when things happen; Poor psychological adjustment; Do not respect others' lives	Cherish life; Psychological adjustment ability; Healthy psychological state; Understanding bioethics
3	"Shaanxi female college students committed suicide due to rent withdrawal". In December 2021, Cheng, a Shaanxi college student, was suspected to have died of poisoning due to a dispute over the deposit for renting a house. Analysis: the landlord said something bad; The pressure is very big, her mood is bad; life is so fragile	Under-graduate commit suicide	Poor pressure resistance and psychological adjustment; Inability to handle interpersonal relationships effectively	Stress tolerance; Psychological adjustment ability; Handling social relations; Commit suicide
4	"A college student in Tianjin committed suicide due to illness". In April 2015, a college student Wu committed suicide by burning charcoal because he was found to have hepatitis B. Analysis: there is a premeditated online purchase of charcoal; Do you see my loneliness from my selfie? Self isolation, resulting in inferiority	Under-graduate commit suicide	Inadequate emotional control; Dealing with problems too extreme; Lack of awareness of common diseases	Medical and health knowledge; Healthy psychological state; Psychological adjustment ability; Commit suicide
5	"The case of college students killing animals" In April 2020, Fan, a college student in Shandong, killed animals and sold videos for many times. Analysis: universities start animal protection education and bioethics education; Students receive psychological treatment; harmonious development between man and nature	Under-graduate Torture and kill animals	Do not respect life; Lack of cognition of harmonious coexistence between human and animals; Lack of understanding of bioethics; Indulge in deformed desire	natural law; Bioethics; Self abandonment; Cognition of life growth law
6	"Sudden death occurs frequently in sports". In March 2022, a student in Shanxi died suddenly in running; In April 2020, a student in Hunan fainted and died during running. Analyze: often stay up late; Concealing basic diseases; Long term unhealthy diet; Not aware of the risks; Long term inactivity	College students sudden death	Lack of exercise at ordinary times; Unhealthy behaviors in daily life; Lack of basic knowledge of health status; Lack of emergency capacity	Emergency risk avoidance knowledge; Life growth law; Daily exercise; Healthy diet

Rooting theory is a classical qualitative research method [12]. This study used the grounded theory method to select and analyze 20 typical incidents of college students' murder, suicide, self-mutilation and other public events given out by the Health Times and the China Judicial Documents Network, such

ISSN 2522-6398 Vol. 6, Issue 1: 107-112, DOI: 10.25236/FER.2023.060117

as the poisoning case of Lin from a university in Shanghai in 2013, the suicide case of Cheng from a university in Shaanxi in 2021, and the animal abuse case of a university student in Shandong in 2020. Select 70% of typical events, invite experts to conceptualize and decode the life education information involved, and get 43 conceptualized information and 35 categorical information; After removing overlapping factors, 30 pieces of categorical information were obtained; Then, combining with the life education theory, the paper analyzes the spindle decoding and selective decoding, and preliminarily arranges the evaluation index system of college students' life education, including 3 core categories, 6 main categories and 21 categories. Details for open decoding analysis of some cases is in Table 2.

3.2.2. Improvement and screening of index system

Two rounds of expert correspondence were conducted for the initially proposed indicator system, and the expert participation rate was 100%. The indicator system was screened and improved based on expert scores and modification opinions. The experts' evaluation of the first level indicators and the second level indicators met the requirements, and the third level indicators were mainly adjusted. After the first round of evaluation, 2 items were modified and 3 items were deleted; The second round of evaluation and scoring were all in line with the requirements, and no specific modification suggestions were put forward; Finally, the evaluation index system of college students' life education is determined from the three progressive levels of "knowledge - concept – behavior", including three first level indicators, six second level indicators and 18 third level indicators. See Table 3 for details

3.2.3. Reliability and validity test of indicator system

SPSS 26.0 was used for statistical analysis. The results showed that Cronbach's α the coefficient is 0.866, the split-half reliability coefficient is 0.845, and the content validity index CVI is 0.818, which reflects that the design of the evaluation index system is scientific and reasonable, with good reliability and validity.

Table 3: Results and Weights of Expert Consultation on Life Education Evaluation Indicators for College Students

First-level indi-cators	Weight-coefficient	second-level indicators	weight coefficient	Third-level indicators	essentiality ($\overline{X} \pm S$,points)	Coefficient of variation	Entropy weight method weight
Physical and mental health knowledge A_1	0.268	Physiological health knowledge U_1	0.146	Cognition of life growth law V_1	4.400±0.503	0.114	0.050
				Cognition of medical and health knowledge V_2	4.650±0.489	0.105	0.050
				Cognition of emergency risk avoidance knowledge V_3	4.300±0.571	0.133	0.047
		Mental health knowledge U_2	0.122	Healthy mental state V_4	4.600±0.503	0.109	0.031
				Compressive resistance V_5	4.600±0.503	0.109	0.048
				Psychological problem adjustment V_6	4.600±0.503	0.109	0.062
Life education conceptA$_2$	0.340	Life First Concept U_3	0.159	Cherish life V_7	4.700±0.470	0.100	0.050
				Love yourself and love others V_8	4.600±0.598	0.130	0.054
				Scientific outlook on life V_9	4.500±0.488	0.108	0.053
		Harmonious symbiosis concept U_4	0.121	Understand the laws of nature V_{10}	4.550±0.605	0.133	0.037
				Adhere to bioethics V_{11}	4.600±0.503	0.109	0.049
				Handling social relations V_{12}	4.500±0.607	0.135	0.038
Life health behavior A_3	0.392	Healthy living behavior U_5	0.204	Adhere to daily exercise V_{13}	4.650±0.489	0.105	0.078
				Keep a good schedule V_{14}	4.700±0.470	0.100	0.075
				Reasonable and healthy diet V_{15}	4.650±0.489	0.105	0.050
		Avoidance of negative behavior U_6	0.188	Substance abuse V_{16}	4.650±0.489	0.105	0.057
				Desperate behavior V_{17}	4.500±0.588	0.131	0.055
				Self-mutilation or suicide V_{18}	4.650±0.489	0.105	0.057

ISSN 2522-6398 Vol. 6, Issue 1: 107-112, DOI: 10.25236/FER.2023.060117

3.3 Index system weight calculation

The entropy weight method determines the weight by the degree of variation of index difference. In this study, 100 valid sample data were collected from college students through a questionnaire survey, and the original data were standardized and dimensionless calculated to determine the entropy value and weight. The weights of physical and mental health knowledge, life education concept and life health behavior of the three first level indicators are 26.8%, 34.0% and 39.2% respectively, which shows the rationality of the overall layout of the indicator system; The weight of the secondary indicators is as follows: healthy living behavior U5 (20.4%)>negative behavior avoidance U6 (18.8%)>life first idea U3 (15.9%)>physiological health knowledge U1 (14.6%)>mental health knowledge U2 (12.2%)>harmonious co physiological idea U4 (12.1%); The weight of V13 (7.8%) of daily exercise, V14 (7.5%) of good work and rest and V6 (6.2%) of psychological problem adjustment among the three indicators is relatively high. See Table 3 for details.

3.4 Correlation results and analysis

Pearson correlation coefficient matrix can directly reflect the correlation between indicators [13]. This study calculated the correlation coefficients of 18 three-level indicators. Taking the indicator "self-mutilation or suicide behavior V18" as an example, a scatter chart of correlation coefficients was drawn for the other 17 indicators. Analysis showed that indicators V1 ~ V15 were negatively correlated with them, and indicators V16 and V17 were positively correlated with them. See Figure 1 for details. It shows that the more sufficient the knowledge of physical and mental health, the more profound the concept of life education, and the healthier the life behavior of individuals, the less likely they are to suffer from extreme behaviors such as self-mutilation and suicide; On the contrary, individuals with substance addiction and self-abandonment are more likely to have extreme behaviors.

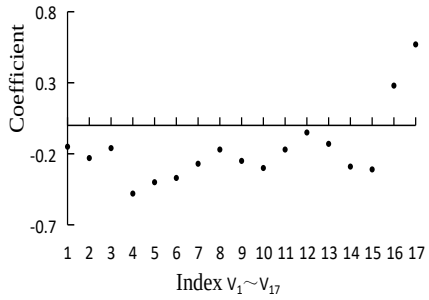

Figure 1: Scatter distribution of correlation coefficient of indicators V1 ~ V17 relative to V18

4. Discussion

4.1 The Importance of the Evaluation Index System of College Students' Life Education

In 2022, the Ministry of Education proposed that disease prevention, mental health, emergency risk avoidance, living habits and other contents should be included in students' life health education [14]. However, at present, life education for college students is generally characterized by fragmentation and superficiality, lacking systematic evaluation. On the basis of exploring and constructing the indicator system, this study calculated the weight of each indicator and the correlation coefficient between indicators, which can provide a reference for promoting the reconstruction of college students' life education content and effectiveness evaluation.

4.2 Determine the scientificness of the indicator system with a mixed method

This research applies grounded theory qualitative research methods to select 20 typical cases of college students' suicide and sudden death related to the lack of life education, and effectively screen, code and decode the referee documents and media reports. Combined with the second round of Delphi method, a three-level indicator system was established from the three levels of "knowledge concept behavior", which covers the core content of life health education. The coordination coefficient of each indicator passed the x2 test, and the importance, variation coefficient and content validity index met the

ISSN 2522-6398 Vol. 6, Issue 1: 107-112, DOI: 10.25236/FER.2023.060117

requirements, which is highly scientific.

4.3 Comprehensive application of indicator system

In this study, entropy weight method is used to calculate the weight of the index system, which provides a quantitative index for scientific evaluation of the effectiveness of college students' life education; At the same time, the correlation coefficient matrix is drawn, and the correlation between indicators is analyzed, which makes the indicator system more valuable. In the process of carrying out life education, colleges and universities can deal with it from the aspects of teaching life and health knowledge, cultivating life and health concepts, and developing healthy life behaviors, so as to prevent and reduce typical extreme events such as college students' suicide, sudden death, and special crimes.

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