

Comprehensive evaluation method in health service management

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Abstract: With the improvement of people's material and spiritual life, people put forward higher requirements to health service and higher standard to health management professional. Therefore, strengthening the construction and development of health management specialty, how to measure and evaluate the development of Health Management Specialty and how to promote the development of health management talents have become key issues in the construction of health service management specialty

1. Current situation of Health management professional development.

1.1. The imminent training of health management professional talents

With the reform of China's economic system and the gradual establishment and improvement of the market economic system, Health management education has been developing rapidly. The outbreaks of avian influenza in 2006, Chinese milk scandal in 2008 and H1N1 in 2009 have alarmed public health and made it urgent to strengthen the training of health management personnel. In March 2009, the state promulgated the "opinions of the CPC Central Committee and the State Council on Deepening the Reform of the Medical and Health System" which called for the adjustment of the structure and scale of Higher Medical Education and the strengthening of the construction of high-level personnel in scientific research, medical care and Health Administration to standardize the conditions for hospital managers and gradually form a professional and professional management team of medical institutions, which puts forward high requirements for innovation and development of Health Management Education.

1.2. The weak foundation for the development of the Health Service management profession

The Health Service management profession started in 1982 with the establishment of the health management profession by the Fudan University Shanghai Medical College. In the past 20 years, most of the country's medical colleges and universities have established health administration or health administration-related specialties, which are still at the stage of fumbling and imitating in specialty construction and personnel training. Although a large number of outstanding professional health service administration talents have been trained, the overall professional construction is still at the initial stage. It shows that the professional orientation, teaching staff, curriculum system design, talent training model, teaching content and methods are relatively weak.

1.3. The lack of its own characteristics in professional orientation of Health Service management

Health Service management is a comprehensive cross-disciplinary and applied discipline involving professional knowledge of management, health, medicine and economics. It requires students to master not only health and medical knowledge, but also theories and methods of economic management, which makes it necessary to give consideration to the teaching of medicine and management knowledge in the course system construction, thus forming a situation in which students cannot learn specialized knowledge in a limited number of hours. It is the difference in the understanding of professional characteristics that has led to the lack of consensus in the professional positioning of health schools across the country, which has resulted in the professional positioning of "giving priority to medicine, taking care of it as a supplement", "taking care of it as a supplement, taking care of it as a supplement", and attaching no importance to it. Therefore, the professional orientation becomes more and more vague and cannot form characteristics, which is not conducive to improving the social competitiveness of health management students.

1.4. The lack of effective evaluation index system

After more than 20 years of professional construction and development, the major of Health Service Administration has achieved remarkable results. It has trained a large number of outstanding talents who serve in health posts, making a huge contribution to society. However, the measurement and evaluation of professional development not only rely on a single standard, but also need comprehensive evaluation indicators to measure. At present, there is no effective evaluation index system to know the development status and stage of Health Service Management Specialty. Therefore, how to construct a complete evaluation index system to make the construction and development of health management specialty more purposeful, regular and step-by-step has become the top priority of current specialty construction and development.

2. Comprehensive Evaluation Methods Commonly Used in Health Service Management

2.1. Analytic hierarchy process (AHP)

Professor T.L. Saaty of the university of Pittsburgh in the United States put forward a method in 1977 to systematize, model and quantify the decision-making thinking of complex phenomena. This method uses the method of system analysis to decompose the overall evaluation objective according to the evaluation goal, and obtains the evaluation goal of each level (each level), and takes the lowest level as the evaluation index to measure the degree of the goal. Then, according to these indexes, a comprehensive scoring index is calculated to evaluate the overall evaluation target of the evaluation object, and the quality grade of the evaluation object is determined by its size.

The basic steps of the method are as follows:

- (1) Establish the hierarchy structure to decompose the overall evaluation objective continuously to get the evaluation objective of different levels, and mark each evaluation objective with a graph organically, that is, establish the objective tree graph
- (2) Construct two-to-two comparison discriminant Matrix.
- (3) Calculate the weight Coefficient.

According to the Formula $W_i' = \sqrt[m]{a_{i1} * a_{i2} * \dots * a_{im}}$ to calculate the initial weight, According to the

Formula $W_i = W_i' / \sum_{i=1}^M W_i'$ calculate normalized weight coefficient

- (4) Calculate the combination weight coefficient of each evaluation index.
- (5) Calculate the comprehensive evaluation index.

According to the Formula $GI = \sum_{i=1}^m W_i'$ get it

(6) Consistency check whether the weight coefficient calculated by consistency check is in accordance with logic. The consistency index CI is commonly used. It is generally believed that when CI is 0.10, there may be no logic confusion.

The advantages of this method are: (1) The principle is simple, the level is clear, and the result is reliable. It not only can be used for the same unit in different time longitudinal comparison, but also can be used for different units in the same time transverse comparison. (2) The index contrast grade division is quite fine, so fully displays the weight function. (3) The original data are not changed by any variables, and the original information is preserved, so that the evaluation results are authentic. (4) The objectivity of thinking can be judged by the consistency test. (5) It applies to complex problems that are difficult to fully quantify.

Disadvantages: (1) The process of constructing the hierarchical structure of ladder is complicated and the calculation is complicated. (2) In the determination of weight, it is difficult to avoid the influence of subjective factors, so this method often needs to be used in combination with Delphi method.

Scope of application: It is mostly used in health service management. In recent years, the law has been applied in the quality of case monitoring system, planned immunization, quality of Health detection, quality of infectious disease reporting and other work and achieved some results.

2.2. Topsis method (Technique for order preference by similarity to ideal solution)

The basic idea of this method is to find out the best and worst schemes in finite schemes (expressed by the best vector and the worst vector respectively) based on the normalized original Data Matrix. Then, the distance between each evaluation object and the best and worst plan is calculated, and the relative close degree between each evaluation object and the best plan is obtained.

The basic steps are as follows:

(1) The same trend of indexes is determined by reciprocal method, i.e. low-priority index X_{ij} ($I = 1, 2, \dots, m$) in the original data is converted into high-priority index through transformation, and then the original number matrix after the same trend is established.

(2) The original data matrix after the same trend is normalized and the corresponding matrix is established

$$a_{ij} = X'_{ij} / \sqrt{\sum_{i=1}^n X_{ij}^2} \quad (\text{Original high-quality index})$$

$$a_{ij} = X'_{ij} \sqrt{\sum_{i=1}^n (X'_{ij})^2} \quad (\text{Original low-quality index})$$

(3) The optimal value vector and the worst value vector are obtained according to the Matrix.

(4) Respectively calculate the distance between all the evaluation objects and the optimal plan and the worst plan.

(5) The close distance between each evaluation object and the optimal plan is calculated

(6) The evaluation objects are ranked according to the size of the distance The larger the value, the better the overall benefit.

The advantages of the method are as follows: 1. There is no strict restriction on data distribution,

sample content and index number, and the calculation is not complicated. 2. The results of ranking can reflect the quality of different evaluation units quantitatively by making full use of the original data. 3. It can eliminate the influence of different dimensions, and can introduce different dimensions of evaluation indicators for comprehensive evaluation.

In many comprehensive evaluation methods, the original data information is used the most fully, and the results can accurately reflect the gap between the evaluation objects.

Disadvantages: (1) CI can only reflect the internal relative degree of each evaluation object, and cannot reflect the relative degree of the ideal optimal scheme. (2) Low sensitivity.

Scope of application: Topsis method is a commonly used method for multi-objective decision analysis of limited schemes in systems engineering. It was originally used for comprehensive evaluation of industrial economic benefits. Now it can be used in many fields such as hospital management, medical quality control, benefit evaluation, health decision-making and health management, especially in the annual evaluation of hospital work.

2.3. Rank Sum Ratio (RSR)

Rank Sum BEFFA is a new set of statistical information analysis method, which was put forward by Professor Tian Fengdiao of list of statisticians in 1988. The basic idea is: In an n -row m -column Matrix, the dimensionless statistic RSR is obtained through rank transformation. On this basis, the distribution of RSR is studied by using the concept and method of parameter statistical analysis. The RSR value is used to rank the evaluation objects directly or in different grades.

Basic steps:

(1) Column original data table: The original data table of n evaluation objects M Evaluation Index N row M column;

(2) Rank: compile the rank of each index, in which the high-ranking index from small to large rank, the low-ranking index from large to small rank,

(3) Calculate the rank sum ratio: according to the RSR value, rank the evaluation object directly;

(4) Determine the distribution of RSR.

The advantages of the method are: (1) Easy operation, no special requirements for data. (2) The rank involved in the calculation can eliminate the interference of abnormal values and solve the confusion in statistical processing when the index value is zero. (3) The RSR value is dimensionless and can contain some special statistic information (such as N , s , CV), percentile OR epidemiological index (such as OR, RR, PAR, etc.). (4) This method can communicate, transplant and graft with many other mathematical statistics methods and quantitative methods. It is an effective means to compare and find the relationship between statistical management and statistical research.

Disadvantage: (1) Because the index value is replaced by rank, some information will be lost, and the elements in the Matrix cannot be missing. (2) The final RSR value can only reflect the difference of the comprehensive rank, but not the difference of the order.

Scope of application: It is widely used in the field of medical and health multi-indicator comprehensive evaluation, statistical forecasting, statistical quality control and so on.

2.4. Syntheticac index method.

The synthetic index is the basic form of compiling the total index, which changes the work indexes of different properties, different categories and different units of measurement into index, and then compares them. The concrete methods are weighted linear sum method, multiplicative combination method, mixed method and so on.

Basic steps: (1) Choose the appropriate indicator. (2) Determine the weight. (3) Search for the

calculation mode of Composite Index. (4) Divide the evaluation grade reasonably. (5) Test the reliability of the evaluation model.

The advantages of this method are as follows: (1) The principle is simple, no complicated operation, and the operation is easy. (2) This method has no strict requirements on the distribution of data and the number of indexes, and has a wide application range. does not strictly (3) The original data were relativized to eliminate the influence of different index dimensions.

Disadvantages: (1) The role of weight is obvious, and is easy to exaggerate the weight of the factors and cover up the weight of the role of small factors. (2) It is difficult to find an ideal general expression for the variety of evaluation models.

Scope of application: It is widely used in preventive medicine, clinical medicine, social medicine and health management. Such as: environmental assessment, nutritional assessment of physical fitness and physical development assessment, evaluation of hospital efficiency, fetal maturity assessment and so on.

3. Conclusion

The above-mentioned methods are commonly used in the field of medical evaluation as well as the principles, advantages and disadvantages and scope of application of each method several methods can also be combined to achieve real and reliable evaluation results. In actual work, the most suitable method should be selected according to the actual situation, and several methods can also be combined to achieve true and reliable evaluation results.

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References

- [1] Chen Xianze. *Research on fuzzy comprehensive evaluation method of health management specialty [J]. Health Soft Science, 2011,25 (09): 597-599.*
- [2] Jiang Fangjing, Yang Weizhong. *Comprehensive evaluation methods commonly used in medicine [J]. Disease Surveillance, 2006 (06): 325-328.*
- [3] *Verification of five health comprehensive evaluation indexes and methods [J]. Shanghai Journal of Preventive Medicine, 1994 (10): 15+3.*