Evaluation Index of Practical Teaching Quality of Medical Information Management based on Stepwise Regression Method

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Abstract
The practice teaching of Medical Information Management specialty has affected the operation level and innovation ability of students to a certain extent, the key point of improving the quality of practice teaching is to strengthen the supervision and management continuously, and its function is the same as the course teaching. The traditional evaluation method of teaching quality mainly emphasizes the students' practice results, and ignores the whole implementation process of the practice teaching. Even if the characteristics of scientific quantification are highlighted in the selection of indicators, it is impossible to establish an evaluation index system closely related to the characteristics of disciplines, so the practice teaching quality can't be evaluated effectively and scientifically further. At present, the research on the evaluation of practice teaching quality is still in its initial stage. Only when the evaluation system of practice teaching quality of medical information management is constructed scientifically and it is linked with the evaluation method of scientific teaching quality, can it objectively reflect the current teaching level. This paper establishes the quality evaluation index system of the practice teaching of medical information management, puts forward an evaluation method of practice teaching quality evaluation index of Medical Information Management specialty based on stepwise regression method, adopts the teaching quality evaluation index and corresponding model with good scientific construction nature, and evaluates the practice teaching quality of medical information management by means of four dimensions which are teaching content, teaching method, teaching attitude and teaching quality, so as to better improve the practice teaching level of medical information management.

Keywords: Medical Information Management, Practice Teaching, Quality Assessment Index, Stepwise Regression Method, Weighting

1. INTRODUCTION

Curriculum practice refers to the practice course established by various professional courses. Practice methods are taught by the teachers, and some practice topics are designed with the theory course (Karthikeyan and Vasuki, 2016). Students are completed individually, and the students' knowledge is understood through the practice report. Curriculum practice is mainly to effectively consolidate and test the knowledge learned in class (Butt and Akram, 2016). At the end of the fifth semester, a 3 week hospital internship was conducted, and the students had already studied the clinical medicine course (Pahlavani, 2017). The practice goal is to help the students to fully understand the overall operation of the hospital procedures, grasp the characteristics of hospital information resources, to help students to consolidate the knowledge and technology of clinical medicine, a comprehensive understanding of medical information development, which lays a foundation for future work, further to ensure the quality of teaching theory.

In general, the top three hospitals in the province are used as practice sites, students study in various departments of the hospital, and the clinical work is analyzed in detail under the guidance of the Department doctors. Library practice should be chosen at the end of the seventh academic year, and students begin to practice for 6 weeks under the premise of completely mastering the theoretical knowledge. Taking the University Libraries inside and outside the province as the practice base. Through the base of teachers, the basic principles and the overall program to help students understand the main functions of library work, work content, business management information; so as to curriculum content strict inspection, combine the theory teaching
and practical production, to enable students to understand the characteristics of the work in library. The students in the eighth semester carry out comprehensive production practice, including graduation thesis design, writing and defense work (Bowman-Perrott, Burke, Mack, Samar, Vannest, 2016). Comprehensive production practice is generally carried out in the Department of medical information management related business administrative departments, such as medical information management departments, University Libraries and research institutions (Farraj, Hammad, Daoud and Kundur, 2016). To enable students to understand the contents of each information department, and the scope of service, fully grasp all aspects of the operation of information dissemination, storage and processing, integration of theory teaching and practical operation of students' attitude is correct, students in the practical base of deep learning, can gradually strengthen the ideological work.

From the disciplines, the first level indicators and the two level indicators fully reflect the characteristics of the practice teaching of medical information management, and effectively distinguish with other disciplines, especially the practice teaching of medical information management. In terms of discipline, it provides an important basis for reforming the practice teaching of medical information management, and promotes the further development of teaching reform, and preliminarily forms the characteristics of higher education. To provide the objective standard of medical information management practice teaching level evaluation of the teaching management, managers can fully understand the teaching situation of the medical information management practice, to obtain information about medical information management practice teaching, through the analysis and research, to determine the need to take effective means, further to practice teaching of medical information management science o. It provides feedback information to teachers, helps teachers grow up, promotes the communication between teachers, trains teachers' initiative, and further improves the teaching level. It provides the feedback information to the students, makes them discover the problems in the study, and fully realizes the details that should be paid attention to, so as to improve the learning effect of the students.

2. CONSTRUCTION PRINCIPLES OF MEDICAL INFORMATION MANAGEMENT PRACTICE TEACHING QUALITY EVALUATION SYSTEM

According to the measurable or observable requirements, the teaching evaluation index system can effectively evaluate the educational evaluation standards and fully exhibit measurable and behavioral characteristics (Ye and Hu, 2016). Therefore, we should combine the decomposition evaluation object attribute related content to construct the evaluation system of medical information management practice teaching quality, in the implementation of behavior standards can be measured, at the same time, pay attention to the operational principles (Clerk and Demeulemeester, 2016). The evaluation target and evaluation index are decomposed step by step, and the total target is successfully divided into different levels of grading index, so as to construct the quality evaluation system of medical information management practice teaching.

Education takes individual development as an important content. Only higher level of higher education can promote the healthy development of students and meet the development needs of students to a great extent. The main content of the quality evaluation of medical information management practice teaching is student evaluation, and it is integrated into the teaching quality evaluation system. Students actively participate in the evaluation work, showing the satisfaction degree of related discipline education in all aspects of service. Therefore, the student evaluation of the practice teaching quality evaluation index of TCM information management emphasizes the satisfaction of students". "Satisfaction" generally regards "satisfaction of resources and environment" and "satisfaction with school management" as the standard of measurement. Among them, "satisfaction of resources and environment" includes "satisfaction with material resources", "satisfaction with learning courses" and "satisfaction with teaching quality". In this paper, starting from the key factors of evaluation of teaching quality in medical information management practice, the specific investigation of the evaluation criteria of teaching quality for students to practice the medical information management awareness, the establishment of quality evaluation system of relative objective. Due to the evaluation of teaching quality in medical information management practice is a kind of behavior can be measured, the criteria, in strict accordance with the basic requirements can be measured or observed to evaluate the quality of the content was positively identified, and combining with the characteristics of evaluation object and decomposition quality evaluation content of constructing evaluation index system.

Using questionnaire survey method, the students' cognition of medical information management practice teaching quality evaluation index is investigated and analyzed. The content of the questionnaire includes four parts: teaching content evaluation index, teaching method evaluation index, teaching attitude evaluation index and teaching quality evaluation index (Alvarado-Quesada and Weikard, 2017).

A total of 300 questionnaires were issued, among which 40 questionnaires were sent to teachers, and 260 questionnaires were sent to students. A total of 300 questionnaires were returned. Of which 276 valid questionnaires, preliminary statistical results are shown in Table 1.
In order to survey the reliability and validity of the strict inspection, take the five point Likert scale survey statistics to answer questions, the general arrangement of “minor, minor, and more important, important, design corresponding scores 1 points, 2 points, 3 points, 4 points, 5 points. The higher the value represents the evaluation of teaching quality in terms of this index is more reasonable.

Step 1. The results of each dimension of the test scale.

The reliability of survey results showed consistency and high stability, is the questionnaire to test the same things repeated measurement reliability analysis whether obtain consistent results, but also be able to accurately judge whether all questions in a survey aiming at the same target. The statistical results indicate that the percentage of options for teaching content and teaching methods, teaching attitude and teaching quality of accounting are generally focused on the important and more important, also shows that the four indicators are key factors that influence the evaluation of teaching quality in medical information management practice.

Step 2. Correlation test among different dimensions of each index.

Correlation analysis of the relationship between the specific research object, while the dependence of the direction and relevance of the discussion, but also the study of statistical random variable correlation method. In order to ensure the scientificity of the quality evaluation index system of medical information management practice teaching, we can strictly verify the correlation and correlation between teaching quality evaluation indicators. After analysis, the correlation coefficient between each index and the teaching content of the teaching content of the dimension represents more than 0.4 related dimensions, evaluation of teaching content has certain feasibility, but A12 and A13 index showed the correlation between Person and A14 unified, parameters have the relationship between the number of similar to 1, that is likely to appear duplicate or invalid index. Further analysis was performed to remove the A13 and A14 variables, and further validity tests were conducted.

Based on the teaching method of each index correlation test, A24 index and A25 showed repeated characteristics, after careful analysis of the A24 index and other indicators are removed, the teaching method has formed more than 0.9 correlation, showed that the questionnaire this part explain the extent of stable and reliable, has no duplicate and invalid phenomenon, which laid the foundation for the validity the next test. At the same time, the relevant indicators of teaching attitude and teaching quality of the formation of a strong relationship dimension.

Step 3. Exploratory factor analysis.

The corresponding values of teaching contents, teaching methods and teaching attitude and teaching quality of the four dimensions of KMO were 0.692, 0.815, 0.815, 0.868, has reached 0.6, indicating the validity and reasonable; take significant water Bartlett test the probability values significantly lower than a given level, to provide a theoretical basis for factor analysis. Such as teaching methods through dimensions, the total variance explained described, the characteristic value changes from the second factors started growing slowly, indicating that other value for the explanation of variance from second factors begin to decrease, so the application of principal factor analysis method reflects the rationality. Analysis of the other three dimensions obtained consistent results, can choose a main factor.

Step 4. determines the retention criteria.

Through the above analysis and inspection, teaching content, teaching methods and teaching attitude and teaching quality as the medical information management practice teaching quality evaluation index system reflects the strong rationality, but in the design of evaluation index link, must have the choice to eliminate part of the target, in addition to A13, A14 and A24 on the other two indicators of reservation.

To fully understand the content and index of evaluation of teaching quality of medical information management practice, to the quality of teaching as the core of science, set up 4 dimensions and 18 indicators of evaluation framework, adopts the questionnaire method to understand the medical information management practice teaching quality evaluation index of the overall understanding of students and teaching staff. Based on the reliability analysis and test, a teaching quality evaluation system including 4 dimensions and 15 indicators is established. The questionnaire is shown in Table 2.
Table 2. Teaching quality evaluation index questionnaire two level index statistics

<table>
<thead>
<tr>
<th>First level index</th>
<th>Two level index</th>
<th>Minor</th>
<th>Relatively Minor</th>
<th>Commonly</th>
<th>Relatively Important</th>
<th>Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Content of Courses A1</td>
<td>The purpose of teaching is clear, the syllabus and plan are followed A11</td>
<td>20</td>
<td>76</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The principles and knowledge are clearly explained A12</td>
<td>41</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The key and difficult point of teaching is proper A13</td>
<td>41</td>
<td>235</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The degree of combination of practice and frontier theory A14</td>
<td>20</td>
<td>21</td>
<td>55</td>
<td>180</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The degree of combining theory with practice and content A15</td>
<td>26</td>
<td>50</td>
<td>200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| The Teaching Method A2 | The teaching method is clear and inspiring and the content is rich A21 | 16 | 30 | 50 | 180 |
| | The creativity is cultivated and knowledge are summarized A22 | 10 | 26 | 80 | 160 |
| | The thinking ability is cultivated by scientific methods A23 | 10 | 30 | 60 | 61 | 115 |
| | The blackboard writing is concise, and the handwriting is neat A24 | 70 | 40 | 56 | 110 |
| | The multimedia methods are adopted with the characteristics of the course A25 | 70 | 40 | 56 | 110 |

| The Teaching Attitude A3 | The lectures are enthusiastic and speaking speed is stable A31 | 20 | 56 | 80 | 120 |
| | The homework was carefully corrected and the questions were patiently answered A32 | 10 | 56 | 60 | 45 | 105 |
| | The teachers’ morality is noble A33 | 20 | 50 | 56 | 30 | 120 |
| | The teaching was done with teaching materials, Enthusiasm for learning is cultivated A34 | 10 | 20 | 40 | 80 | 126 |

| The Teaching Quality A4 | The explanation is clear and the thinking is active A41 | 30 | 50 | 70 | 126 |
| | The teaching atmosphere is active A42 | 20 | 30 | 56 | 70 | 110 |
| | The acceptance of the students is good A43 | 30 | 40 | 50 | 156 |
| | The active thinking for students is done A44 | 30 | 40 | 31 | 55 | 120 |
3. CONSTRUCTION METHOD OF MEDICAL INFORMATION MANAGEMENT PRACTICE TEACHING QUALITY EVALUATION INDEX

Study on the method of analysis and qualitative analysis combining qualitative analysis, the overall influence factors on the evaluation of teaching quality in medical information management practice, humanistic care, teachers’ teaching theoretical knowledge, knowledge development and cultivation of professional ability to explain the research to the medical information management practice teaching quality evaluation, evaluation system of medical information management practice teaching quality includes teachers' professionalism, work attitude, teaching methods etc.

The teaching quality evaluation index system was initially constructed to judge the practical teaching level of medical information management, among which the calculation method of correlation score was as follows:

Let $y$ be a dependent variable, $x_1, x_2, ..., x_m$ is all independent variables, $y_i, x_{i1}, x_{i2}, ..., x_{im} (i = 1, 2, ..., n)$ is an independently extracted $N$ group sample. The significant level of the independent variable was selected as the model, and the significant level of the excluded model was as follows,

Step 1. Calculation of deviation matrix $S$

$$S = S_{new} = egin{bmatrix} S_{11} & S_{12} & ... & S_{1m} & S_{1y} \\ S_{21} & S_{22} & ... & S_{2m} & S_{2y} \\ ... & ... & ... & ... & ... \\ S_{m1} & S_{m2} & ... & S_{mn} & S_{my} \end{bmatrix}$$  \hspace{1cm} (1)

Step 2. gradually screened independent variables

Calculate the contribution of each variable

$$V_j^{(i)} = \frac{S_{jj}^2}{S_{jj}}$$  \hspace{1cm} (2)

Maximum value

$$V_{k_i}^{(i)} = \max_{1 \leq j \leq m} V_j^{(i)}$$  \hspace{1cm} (3)

Whether the effect of step 3 is statistically significant or not, then

$$F = \frac{V_{k_i}^{(i)}}{S_E^{(i)} / (n - 1 - 1)}$$  \hspace{1cm} (4)

$$S_E^{(i)} = S_E - V_{k_i}^{(i)}$$  \hspace{1cm} (5)

If

$$F \leq F_{a_i} (1, n - 1 - 1)$$  \hspace{1cm} (6)

all the independent variables were independent of $y$, and the regression equation could not be established.

If

$$F > F_{a_i} (1, n - 1 - 1)$$  \hspace{1cm} (7)

then $x_{k1}$ is selected into the model, and $S$ is converted to $S_{new+m+1}^{(i)}$.

$$S_{new+m+1}^{(i)} = \begin{bmatrix} S_{11}^{(i)} & S_{12}^{(i)} & ... & S_{1m}^{(i)} & S_{1y}^{(i)} \\ S_{21}^{(i)} & S_{22}^{(i)} & ... & S_{2m}^{(i)} & S_{2y}^{(i)} \\ ... & ... & ... & ... & ... \\ S_{k1}^{(i)} & S_{k2}^{(i)} & ... & S_{km}^{(i)} & S_{ky}^{(i)} \\ ... & ... & ... & ... & ... \\ S_{m1}^{(i)} & S_{m2}^{(i)} & ... & S_{mn}^{(i)} & S_{my}^{(i)} \end{bmatrix}$$  \hspace{1cm} (8)
Calculate the contribution of each variable according to $S^{(1)}_{m(m+1)}$.

$$V^{(2)}_i = \left( \frac{S_{ii}}{s_{ii}} \right)^2$$

$$V^{(2)}_{k_i} = \left( \frac{S^{(1)}_{k_i k_i}}{s_{k_i k_i}} \right)^2$$

Take the maximum contribution of the independent variables outside the model, that is

$$V^{(2)}_{k_2} = \max_{j \neq k_1} V^{(2)}_j$$

$$F = \frac{V^{(2)}_{k_2}}{S_{E}^{(2)} / (n - 2 - 1)}$$

$$S_{E}^{(2)} = S_T - V^{(2)}_{k_2}$$

If

$$F \leq F_{\alpha} (1, n - 2 - 1)$$

Then, the regression equation, namely the optimal regression equation, is established; if

$$F > F_{\alpha} (1, n - 2 - 1)$$

The election $X_{k_1}$. Entry model,

$$S^{(2)}_{m(m+1)} = \begin{pmatrix}
S^{(2)}_{1} & S^{(2)}_{12} & \cdots & S^{(2)}_{1m} & S^{(2)}_{1y} \\
S^{(2)}_{21} & S^{(2)}_{2} & \cdots & S^{(2)}_{2m} & S^{(2)}_{2y} \\
\vdots & \vdots & \ddots & \vdots & \vdots \\
S^{(2)}_{k_1} & S^{(2)}_{k_12} & \cdots & S^{(2)}_{k_1m} & S^{(2)}_{k_1y} \\
\cdots & \cdots & \cdots & \cdots & \cdots \\
S^{(2)}_{m1} & S^{(2)}_{m2} & \cdots & S^{(2)}_{mm} & S^{(2)}_{my}
\end{pmatrix}$$

among
The next step is to screen.
Assuming that the step 1 filtering has been carried out and \( P \) independent variables have been selected, the corresponding squared sum of residuals is \( S_E^{(l)} \), and the deviation matrix is

\[
S_{m \times (m+1)}^{(l)} = \left[ \begin{array}{cccc}
S_{11}^{(l)} & S_{12}^{(l)} & \cdots & S_{1m}^{(l)} \\
S_{21}^{(l)} & S_{22}^{(l)} & \cdots & S_{2m}^{(l)} \\
\vdots & \vdots & \ddots & \vdots \\
S_{k1}^{(l)} & S_{k2}^{(l)} & \cdots & S_{km}^{(l)} \\
S_{m1}^{(l)} & S_{m2}^{(l)} & \cdots & S_{mm}^{(l)} \\
\end{array} \right]
\]

(19)

Contribution of calculating independent variables

\[
V_i^{(l+1)} = \left\{ \begin{array}{c}
\frac{S_{ij}^{(l)}}{S_{ii}^{(l)}} (i = j) \\
\frac{S_{ij}^{(l)}}{S_{ii}^{(l)}} (i \neq j) \\
\end{array} \right\}
\]

(20)

Check whether the selected independent variables are significant, and take the minimum of the variables in the model

\[
V_k^{(l+1)} = \min_j V_j^{(l+1)}
\]

(21)

Calculation

\[
F = \frac{V_k^{(l+1)}}{S_E^{(l+1)}}
\]

(22)

\[
S_E^{(l+1)} = S_r - V_k^{(l+1)}
\]

(23)

If

\[
F \leq F_{a_2} (1, n - p - 1)
\]

(24)

Remove \( x_i \).
If
\[ F > F_{m2}(1, n - p - 1) \]  
(25)

\( x_i \) cannot be excluded.

Take the maximum value of the outside variable contribution of the model,
\[ V_k^{(i+1)} = \max_j Y_j^{(i+1)} \]  
(26)

Calculation
\[ F = \frac{V_k^{(i)}}{\left( \sum_i V_i^{(i+1)} \right)} \]  
(27)

Turn \( S_{m(m+1)}^{(i)} \) into \( S_{m(m+1)}^{(i+1)} \), step \( i \rightarrow 2 \) screening.

Based on the above research, the evaluation index weights assigned to each practice of medical information management in teaching quality can be selected in the application of AHP method, this method is based on the object as a system, through the system in all levels of factor analysis, further ordered levels of interrelated factors and scientific division accurate assessment of factors for each level include, have relatively important quantitative criteria, further fuzzy standards of science, from human impact.

In the process of teaching quality in the dimension of the weight division can take the golden scale analytic hierarchy process. The weight between the 9 scale method and the 1.354 scale method can not only prevent the problem of too small weight, but also prevent the phenomenon of the weight of the high degree to the greatest extent. After careful calculation, three index weights of teaching content based on the formation of the specific dimension of A1 is 0.500, 0.309, 0.191; A2, A3, teaching attitude, teaching quality A4 teaching method based on four index weight and medical information management practice teaching quality evaluation of the four dimensions of comprehensive weight under the target were 0.447, 0.276, 0.171 0.106. You need to contact the project evaluation target, the questionnaire and the expert advice on project specific weight distribution. You can take a quality evaluation method with modern characteristics of the Internet in the formation of the implementation of collection, judgment and statistics of the information about the teaching of medical information management practices, and scientific applications such as induction and deduction method of overall teaching quality evaluation data, adopt a teaching quality evaluation index and the corresponding model is good, the scientific construction of nature, with the help of teaching the contents, teaching methods, teaching attitude and teaching quality of the four dimensions of the implementation of teaching quality evaluation of medical information management practice, the practice of medical information management to improve the teaching level in order to better water.

4. CONCLUSION

Medical information management specialty is an innovative specialty which can cultivate all-round development of morality, intelligence and body and meet the needs of information management in hospitals, medical colleges and other institutions. In order to better meet the needs of application-oriented talents, students not only need a wealth of theoretical knowledge, but also need a strong level of practical operation. It plays a great role in cultivating innovative talents and realizing quality education. Scientific evaluation will improve teaching quality effectively. In this paper, the medical information management practice teaching quality evaluation index is carefully analyzed, which greatly improves the level of practice teaching of medical information management.
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