



Development and Standardization of a Questionnaire for Quality Assessment of Clinical Education Provided by Faculty Members of Rehabilitation School

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Abstract

Background and Objectives: Teaching clinical skills to students who provide health services is of great importance. Many universities use questionnaires to make qualitative assessments about the teaching of these skills based on the students' point of view. In many cases, the learning environment affects teaching; however, this issue is not often taken into account while designing questionnaires. In addition, it is necessary to specialize the questionnaires because the clinical trainings of different medical groups differ from each other. The aims of this study were 1, to develop a questionnaire that could be used for quality assessment of clinical education provided by faculty members of rehabilitation school and 2, to evaluate the validity and reliability of such a questionnaire.

Methods: Based on the clinical education curriculums of the departments of rehabilitation school, a questionnaire consisting of two sections assessing teaching quality (24 items) and learning environment (7 items) was designed. Face and content validity of the questionnaire was approved during several feedback stages based on the opinions of the faculty members. In addition, the reliability of the questionnaire was evaluated by administering it to 25 undergraduate students during a given time interval.

Results: Using Cronbach's alpha, the internal consistency values of the questionnaire for teaching quality and learning environment components were found to be 0.94 and 0.73, respectively. The results of the test-retest reliability were as follows: intraclass correlation coefficient (ICC) of 0.95 and 0.96; Pearson correlation coefficient of $r = 0.92$ and $r = 0.93$, and paired t-test of $P > 0.05$.

Conclusions: Both the teaching quality and learning environment sections in the designed questionnaire were found to be valid and reliable. The results showed that the questionnaire could be used to assess the quality of clinical education provided by faculty members in rehabilitation schools.

Keywords: Assessment, Clinical Education, Questionnaire, Rehabilitation School, Validity, Reliability, Learning Environment

1. Background

One of the most important missions of universities is training the specialists who will be able to serve the community and be responsible for the development and promotion of knowledge, promotion of research, and provision of proper conditions for the development of the country (1). Considering that medical education deals with human health, its quantitative and qualitative aspects deserve focus (2).

One of the fundamental principles in designing educational programs is to attempt to ensure that the designed program can improve educational programs and improve teaching and learning methods; in order to achieve this objective the evaluation system requires change (3). The main objective of an evaluation process is to reduce undesirable activities and methods and replace them with effective

and useful methods. Various information sources, such as self-assessment, assessment by peers or authorities, assessment by students, and direct observations (video check), can be utilized in the evaluation process (4).

Using the feedback of faculty members and students plays an effective role in altering and updating educational programs (5). One of the functions of student surveys is to provide feedback to lecturers that can help them improve the quality of instruction (6); such feedback can be used to improve strengths and alleviate any weaknesses (7).

On the one hand, the results of lecturers' evaluations are of particular importance and cannot be ignored; on the other hand, due to the lack of accurate and valid tools used to collect information on the quality of lecturer training, the precise documentation required for the correct assessment is difficult to achieve. These factors have led to com-

plexity in lecturers' evaluations (8).

Though many factors can affect students' survey results, it is important to use their comments along with other sources of information. Today, educational administrators in universities across the country formally or informally seek out students' opinions about how faculty members teach. Based on these views, they judge and assess the lecturers (9).

Using student feedback to evaluate lecturers is a common, well-known method used by many of the world's major universities in order to alter and promote their educational programs.

Nevertheless, research evidence suggests that sometimes students' opinions about lecturers are influenced by various factors, including executive factors related to teaching, characteristics of the course, personality of the lecturer, characteristics of the students, and previous and current interests in the subject; these factors are often not much related to the subject of evaluation (10).

Clinical education is an opportunity for students to convert their theoretical knowledge into clinical skills, which will be needed by patients (11). The results of some studies have shown that some schools cannot provide students with the skills necessary for diagnosis and management of patients' care. Therefore, the re-evaluation of educational processes in the clinical field is inevitable in order to achieve effective teaching methods (12).

The quality of lecturers' teaching in academic centers is often evaluated annually by using a questionnaire. The results obtained are presented confidentially in order to use student's views to make changes and improve the quality of teaching.

If students' opinions are going to be used to evaluate the lecturers' performance, it is necessary to use questionnaires that are comprehensive and prepared by evaluation specialists. Such questionnaires should include generalizable questions and indicate the main variables of the test (13). One can rely on the results of such evaluations if the tool used for collecting data has sufficient accuracy and validity (14).

Many studies abroad have been carried out to assess the validity and reliability of questionnaires for assessing lecturers' teaching (15); however, limited studies have dealt with the role of the internship environment in determining the quality of the clinical education delivered to students (16).

In one study to investigate the role of clinical environment in learning, 16 nursing students only referred to their clinical experience (17). In searches of the literature, no information was found about any other studies with objectives similar to those of the present study.

A few reports have been published in the country in

this context, and some of these have examined the factors affecting the quality of clinical education. However, these studies have not indicated the role of internship environment in determining clinical education quality (18).

Some other studies have only examined the role of the physical environment of educational settings in theoretical courses such as mathematics (19). However, both inside and outside the country, no similar research studies were found.

Any measurement tool, regardless of its goal, has certain characteristics, the most important of which are validity and reliability. Without knowledge of the validity and reliability of the measurement tool, the accuracy of the data obtained cannot be guaranteed (20).

Considering that the questionnaires are used to analyze the outcome of the quality assessment of educational performance in schools, the availability of a comprehensive questionnaire with acceptable validity and reliability is always considered as the first step of evaluation (i.e., getting feedback from learners), which has been the concern of those involved in education.

Providing desirable health services to the community is one of the objectives of graduates' training in the field of rehabilitation. Therefore, the development of a questionnaire for assessing the performance of faculty members during the training of students in clinical settings seems very necessary.

Various questionnaires available in this field (not only those specifically created for rehabilitation schools) have some items in common with each other. On the other hand, in evaluating the quality of clinical education provided by faculty members in rehabilitation school, it was found that in some cases, the faculty members' performance was influenced by the "clinical education environment". The students of this faculty had always utilized the educational environment of university teaching hospitals. In many cases, the lack of cooperation or undesirable behaviors of the staff from other wards or the lack of a favorable environment for presenting conferences and case reports on patients in need of rehabilitation services were found to have reduced the quality of the clinical training courses, especially in hospitalization wards.

Thus, it seems that evaluating the quality of the teaching alone was not helpful in providing appropriate feedback that could be used to improve the quality of clinical training courses. For this reason, the necessity of designing a comprehensive, valid, and reliable questionnaire was felt.

In addition, with the development of new instruction forms, such as the professional ethics instruction, in Tehran University of Medical Sciences, it became necessary to include some items that specifically address this aspect

of faculty members' skills in the questionnaires.

Therefore, the present study was conducted with the aim of developing and evaluating the validity and reliability of the questionnaire used for quality assessment of the clinical education provided by faculty members in rehabilitation schools. This questionnaire consisted of two sections (one assessing teaching quality and one assessing learning environment).

2. Methods

This study utilized methodological research with the aim of developing and standardizing an assessment tool. First, the questionnaire was prepared by searching electronic resources. In this regard, out of the 15 questionnaires examined, 9 questionnaires had been specifically designed to assess the quality of clinical teaching of faculty members.

By comparing the questionnaires, it was found that they had 10 items in common with each other and 5 items that were not similar. There were 9 items in the questionnaire developed for faculty members in rehabilitation school which did not exist in the other questionnaires. These items were designed based on the views of some of the experienced clinical trainers. They included items such as "s/he organizes student conferences based on the patients being treated and students' needs," and "s/he provides students with the equal opportunities to gain clinical experience (in terms of type and number of patients)". These questions had not been included in any of the previous questionnaires, but they were necessary to increase the accuracy of the assessment information obtained.

In order to design the initial questionnaire, all items (including common items, distinct items, and rehabilitation school-specific items) were first placed on a single form. Next, the items that shared a common concept were deleted. For example, "creating motivation and encouraging creativity in students" had a concept in common with "s/he encourages students to carry out auxiliary activities (presentation of conferences, articles, and case reports)". Similarly, "trainer's proficiency in conducting and training clinical care" was found to be similar to "sufficient mastery in utilizing clinical skills in the relevant ward".

While developing the questionnaire, the designers attempted to include not merely one domain of teaching, but also various domains, including observance of the principles of teaching and professional ethics, or observance of discipline and scientific capability. The items on the initial questionnaire were reviewed in the presence of an expert panel according to the clinical education curriculum used by the departments of the school.

In response to previous students' feedback, which expressed dissatisfaction with some clinical training courses mainly due to inappropriate learning environment and lack of cooperation from some of the medical staff, leading to a low assessment score in that courses, a new section entitled "learning environment" (including 7 items) was added to the questionnaire.

Thus, a questionnaire consisting of two sections assessing teaching quality (20 items) and learning environment (7 items) was developed based on the five-point Likert scale. The questionnaire was provided to the faculty members in order to gain their important feedback.

After the university emphasized adherence to professional ethics, and the instructions for lecturers' professional commitment were codified, the questionnaire was re-evaluated and specific items related to this context were added to complete the questionnaire. The final questionnaire included 24 items on teaching quality assessment (7 items on domains of educational design and management, 9 items on specialized knowledge and compliance with teaching principles, and 8 items on ethical and professional skills) along with 7 items on learning environment assessment.

Next, during several feedback sessions where the opinions of the faculty members were taken into account, the final version of the comprehensive questionnaire for assessment of clinical education quality was designed, and its face and content validity were confirmed.

Finally, to assess the reliability of the assessment tool, the questionnaire was completed in two-time points by undergraduate students. The questionnaire was distributed to 40 senior students and they completed it in the two-time points. The students were unaware that the questionnaire was created for research purposes.

During the testing procedure, students were provided with questionnaires and assured that the results would be examined confidentially. Lastly, they were asked to write down their student codes in the questionnaire. To perform a retest, this procedure was administered in the same manner after a period of 48 hours. After completing the retest, those who completed the questionnaire only during one session were excluded from the study by identifying and matching their student codes. Those who completed the questionnaires at both sessions were retained for the study.

Since the questionnaire included two sections (quality assessment of clinical teaching and quality assessment of clinical learning environment), statistical analyses were carried out separately on each section.

The internal consistency of the questionnaire was assessed using Cronbach's alpha coefficient, and test-retest reliability was calculated using Pearson correlation coefficient.

cient, a paired t-test, and intraclass correlation coefficient (ICC). The confidence level for statistical calculations was set at 95%, and the significance level was considered as $P < 0.05$. Data were analyzed using SPSS version 17 (version 17, SPSS Inc., Chicago, IL).

3. Results

The qualitative face and content validity of the assessment tool was examined by taking into account the opinions of the faculty members from all the departments of the school. This task was achieved by making contact by the university automation system. To this end, the lecturers were asked to provide their feedback on each item of the designed questionnaire. Accordingly, limited modifications were proposed, and most of the lecturers approved the designed questionnaire.

Regarding the second section of the assessment questionnaire (assessment of clinical learning environment), out of 25 questionnaires, 2 were incomplete. Thus, the number of samples that could be examined for this section of the questionnaire decreased to 23.

The total mean score for the clinical teaching assessment section (the first 24 questions) was 99.48 ± 17.44 . The total mean score for the clinical learning environment (the last 7 questions of the questionnaire) was 19.30 ± 5.46 .

Descriptive values related to domain 1 (educational design and management), domain 2 (specialized knowledge and compliance with teaching principles), and domain 3 (ethical and professional skills) in the first section of the questionnaire are presented in [Table 1](#).

Using Cronbach's alpha, internal consistency was calculated as 0.94 and 0.73 for the first and second parts of the questionnaire, respectively.

Cronbach's alpha values in the case of removing every item in the first and second parts of the questionnaire as well as the values of correlation with the total items are presented separately in [Table 2](#) and [Table 3](#).

The correlation value for each item with the total items in the first section of the questionnaire (teaching quality) were moderate to very high, with the exception of questions 4, 11, and 21, which showed low correlations.

In the learning environment section, all the items showed a high correlation with the total items (except for the first and second questions).

Test-retest reliability for the first and second sections of the questionnaire showed ICC = 0.95 (95% confidence interval (CI) = 0.89 - 0.98) and ICC = 0.96 (95% confidence interval (CI) = 0.90 - 0.98), respectively.

The Pearson correlation coefficients for the first and second sections of the questionnaire were $r = 0.92$ and $r = 0.93$, respectively.

In addition, paired t-test did not show any significant difference between the total mean score of the first section and that of the second section of the questionnaire. However, in a separate examination of the questions, it was found that only the first question of the first section ("specification of the goals of internship") showed a statistically significant difference ($P = 0.001$), and other items of the questionnaire, even those in the second section, did not show any significant difference ($P > 0.05$).

The correlation for question 24 ("considering all aspects, internship was helpful with this trainer") with the total mean score of the first 23 questions was very high ($r = 0.89$).

Examination of the correlation of each of the three domains with the total questions of the questionnaire (total domains) showed that there was a direct and significant correlation ([Table 4](#)).

4. Discussion

Clinical education, including rehabilitation courses, forms a large part of students' medical education. Considering the fact that rehabilitation students deal with different patients, it is important to improve the quality of clinical teaching provided by faculty members in order to respect patients' rights and promote the health system.

One of the ways to improve the quality of clinical education is assessment, which can help identify weaknesses and improve strengths.

A good assessment requires valid and reliable tools that can aid it in meeting its goals. In other words, any assessment tool designed to evaluate the clinical education of rehabilitation students should be able to include criteria specific to the clinical education in the above-mentioned disciplines.

The main goal of this study was to design a questionnaire for assessing the quality of clinical education provided by faculty members of the rehabilitation schools and to evaluate its content validity and reliability.

The results of this study showed that the median score for the first section of the questionnaire was high (106.0). The total median score in domains 1 to 3 was 30, 39, and 36, respectively.

In other words, students' level of satisfaction with the quality of clinical education provided by trainers was at a favorable level. In the second section of the questionnaire, the total median score was 19.0, which, based on the maximum score of 35.0 in this section, indicates the relative satisfaction of the students with the clinical environment.

Regarding the internal consistency of the items in the questionnaire, the first section had an excellent internal

Table 1. Central and Dispersion Indicators of the Quality of Learning Environment and Clinical Teaching Based on Total and Separate Domains

Type of Assessment	Mean \pm SD	Median	Minimum	Maximum
Quality of clinical teaching	99.48 \pm 17.44	106	57	120
Quality of learning environment	19.30 \pm 5.46	19	4	28
Domain 1	28.76 \pm 5.23	30	18	35
Domain 2	36.20 \pm 7.24	39	17	45
Domain 3	34.52 \pm 5.74	36	20	40

consistency (0.94), and the second had an acceptable internal consistency (0.73) (20, 21).

Investigating changes in the Cronbach's alpha coefficient in case of deleting any of the 24 items in the first section of the questionnaire and any of the 7 items in the second section indicated the following results. None of the items in the questionnaire significantly altered its internal consistency, and in total, all items represented a single concept and did not need to be changed or removed.

Therefore, it can be said that the designed questionnaire had an acceptable internal consistency (Cronbach's alpha coefficient greater than 0.7).

Similar research studies focusing on questionnaires for assessing the clinical education provided by trainers could not be found. However, the results of the first section of the current questionnaire were in line with the findings of Kashaninia et al. about questionnaires evaluating the theoretical teaching of faculty members (22), the findings of Wilson et al. regarding a self-constructed questionnaire (student course experience questionnaire) (23), and with Cronbach's alpha coefficients of 0.98 and 0.95, respectively. These results show the excellent agreement of the items of the questionnaire.

The correlation values for each item with the total items in the first section of the questionnaire (teaching quality) were moderate to very high. The exceptions to this finding were question 4 ("presence in the ward or clinic according to the schedule"), question 11 ("mastery in working with specialized devices"), and question 21 ("observing the professional dress code of the university"), all of which showed lower correlation.

From the viewpoint of students, these items were considered to have less importance in assessing the quality of clinical teaching.

In the learning environment section, there was a great correlation between each item and the total items, except for the first question ("environment and educational facilities of the conference room") and the second question ("properly working and up-to-date diagnostic/treatment medical equipment").

The ICC coefficient for determining the internal reliability

of the components of the questionnaire was 0.95 and 0.96 for the items in the first and second sections of the questionnaire, respectively.

Given the confidence interval of each of these values, it can be said that the items in the questionnaire have a high degree of reliability and that they can be used in the assessment tool.

In addition, Pearson's correlation coefficient was very high in the first and second sections of the questionnaire (0.92 and 0.93, respectively). Pearson correlation coefficient of each domain with the total items of the first section of the questionnaire was also very high (0.93, 0.96, and 0.97 for the domains of educational design and management, specialized knowledge and compliance with the teaching principles, and ethical and professional skills, respectively).

Considering that question 24 ("considering all aspects, internship was helpful with this trainer") is a question that would indicate the student's overall assessment of the trainer's educational performance, its correlation with the average score of the first 23 questions was examined, and it showed a significant relationship ($r = 0.89$).

In other words, this question can reflect the students' viewpoint and general assessment of the quality of clinical education provided in the internship program.

This finding was consistent with the results of Shakurnia et al. (24). They reported the correlation coefficient between the mean of the first 14 questions and question 15 as 0.82 (24).

Compared to the findings of Kashaninia et al., which reported a correlation of 0.69 (22), it can be stated that the current questionnaire has a high degree of reliability.

Shakurnia et al. stated that there is a high correlation (from 0.676 to 0.823) between every item of the questionnaire and the total score (24).

In addition, Lin et al. evaluated the results of research on the validity and reliability of a questionnaire for assessment of faculty members teaching and reported the average internal consistency between the items of the questionnaire at 0.85 (from 0.74 to 0.90). This finding is consistent with the results of the present study (25).

Table 2. Cronbach's Alpha Coefficients for the First Part of the Questionnaire

Items	Content	Mean Score in Case of Removing the Item	Cronbach's Alpha Coefficient in Case of Removing the Item	Value of Regression with the Total Items
Question 1	Specification of the goals of internship	95.48	0.94	0.48
Question 2	Conveying the concepts of learning	95.28	0.93	0.80
Question 3	Updated scientific information	95.04	0.93	0.75
Question 4	Presence based on schedule	95.04	0.94	0.34
Question 5	Performing practical examinations and clinical skills	95.44	0.93	0.85
Question 6	Appreciating the patient history taking	95.16	0.94	0.62
Question 7	Helping to make correct clinical decisions	95.32	0.93	0.87
Question 8	Conducting clinical examinations	95.40	0.93	0.73
Question 9	Setting up student conferences	95.44	0.94	0.54
Question 10	Determination of the appropriate duration of examination/treatment	95.92	0.94	0.56
Question 11	Mastery of working with devices	96.24	0.94	0.37
Question 12	Discussing necessary topics related to internship	95.36	0.93	0.75
Question 13	Monitoring the timely attendance of students	95.00	0.94	0.49
Question 14	Providing equal opportunities for each student to get clinical experience	95.16	0.93	0.75
Question 15	Feedback based on ongoing evaluations	95.88	0.94	0.53
Question 16	Adherence to ethical principles	94.96	0.93	0.86
Question 17	Emotional relationship with the patient	95.32	0.93	0.70
Question 18	Keeping medical secrets and patient dignity	95.04	0.94	0.60
Question 19	Guiding patients and referring them to required specialties if necessary	95.28	0.93	0.75
Question 20	Being respectful to members of the treatment team	95.04	0.94	0.64
Question 21	Observing the professional dress code of the university	95.04	0.94	0.30
Question 22	Criticizing colleagues effectively instead of backbiting	95.48	0.94	0.57
Question 23	Taking responsibility for assigned tasks	95.28	0.93	0.80
Question 24	Usefulness of this internship	95.44	0.93	0.89

4.1. Conclusion

The results of this study show that the designed questionnaire is comprehensive, valid, and reliable and can provide accurate and reliable information for assessing

the quality of clinical education provided by faculty members in rehabilitation schools in universities of medical sciences across the country.

Table 3. Cronbach's Alpha Coefficients for the Second Part of the Questionnaire

Items	Content	Mean Score in Case of Removing the Item	Cronbach's alpha Coefficient in Case of Removing the Item	Value of Regression with the Total items
Question 1	Environment and educational facilities of the conference room	16.65	0.73	0.28
Question 2	Properly working and up-to-date diagnostic/treatment equipments	17.47	0.85	0.27
Question 3	Wardrobe and closet facilities for students	16.86	0.64	0.66
Question 4	The behavior of clinic staff	15.78	0.64	0.68
Question 5	The behavior of nursing staff in the relevant ward	16.21	0.64	0.65
Question 6	The behavior of medical staff in the relevant ward	16.52	0.64	0.62
Question 7	Cleanliness and discipline in the clinic/ward	16.30	0.63	0.73

Table 4. Pearson Correlation of Each Domain with the Total Domains^a

Variables	Total Domains	Domain 1	Domain 2
Domain 1	0.93	1.00	0.82
Domain 2	0.96	0.82	1.0
Domain 3	0.97	0.87	0.91

^aSignificance level of $P < 0.05$.

Supplementary Material

Supplementary material(s) is available [here](#) [To read supplementary materials, please refer to the journal website and open PDF/HTML].

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