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Development and Psychometrics of a Questionnaire to Assess the Importance of Integrated Education in Undergraduate Nursing from the Perspective of Faculty Members

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Abstract

Background: Despite the importance of integrated education in nursing, limited studies have been conducted to develop appropriate tools to assess its importance in Iran.

Objectives: The present study aimed to develop a questionnaire and psychometrically assess the importance of integrated education in nursing from the perspective of faculty members.

Methods: This is a consecutive exploratory mixed study conducted in two stages. In the first stage, the concept of Intergrated training was explained via qualitative theme analysis and the relevant key themes of the identification articles were coded. Sampling was purposeful and continued until saturation. In the second (quantitative) stage, first the face and content validity was reviewed and the necessary corrections were made by 15 experts. Then, the reliability of the questionnaire was calculated using internal consistency method (Cronbach's alpha) and the construct validity of the instrument was calculated using exploratory factor analysis.

***Results*:** 203 items were extracted via qualitative content analysis and review of related scientific texts. After performing face and content validity (qualitative and quantitative) 162 items remained. Exploratory factor analysis led to the removal of 50 items and thus 112 items in 4 factors (dimension or scope), including educational content, educational activities, context and conditions. An evaluation was extracted which explained these 4 factors of 87.774 of the total variance. The reliability of the instrument with Cronbach's alpha was 0.92.

Conclusion: The questionnaire on the feasibility of the integrated curriculum in the field of nursing with features such as reliability and validity can be easily used by faculty members and policy makers. It is suggested that other psychological features of the instrument such as convergent and divergent validity be examined in future studies.

Keywords: integrated curriculum, nursing, psychometric assessment, questionnaire

Introduction

The four-year nursing course is one of the university education courses aiming to train capable and competent nurses to maintain and promote community health. Therefore, due to the increasing progress in nursing education and considering that the field of nursing is a combination of theoretical and clinical sciences (Theoretical and clinical sciences), there is a need to use new educational approaches in this field [1] A flexible model of learning, the use of educational methods that are appropriate to the level of needs (level of needs), learning style (Learning style), and the form of work of learners for improving the quality of education and training of competent and professional nurses are

very important to provide quality care, meet the health needs of the community, and raise the need for changes in educational methods and the use of new methods in this field [2].

On the other hand, due to the fact that many nursing trainings take place in clinical departments, it is not possible to use e-learning alone [3-4]. The use of blended method in nursing education using modern educational techniques can simultaneously employ both face-to-face and non-face-to-face methods. This method will provide the opportunity to deepen learning and improve the quality of education [5]. Conversely, without using the integrated method, there may not be enough opportunity to express all the material to the learners' mood. Despite the importance of integrated education in nursing, no tool was found to measure the importance of this education from the perspective of curriculum specialists and nursing professors in IranSome tools have been designed about the importance of this type of education in fields other than nursing, which that have been used repeatedly in Iran and many other countries [6-18]. The designed tools only assessed some of the factors of Intergrated training and none of them paid attention to all the factors associated with the integrated curriculum. Therefore, the present study aimed to develop a psychometric assessment of integrated training assessment tools in nursing from the perspective of nursing faculty members.

Methods

The present study was conducted via mixed research method, a consecutive exploratory (qualitative-quantitative) type of research which is part of the larger study of the doctoral dissertation on curriculum planning entitled "Designing and validating an integrated curriculum model (virtual-non-virtual) in the field of nursing education". This study was conducted within three years from 1997 to 1999 with the participation of nursing faculty members in medical universities (including Tehran, Iran, Shahid Beheshti, Mashhad, Tabriz, Shiraz, Isfahan). The following stages of tool development and psychometrics based on methodology, Ebadi and Zareian (1397) are mentioned in detail.

To produce the item by content analysis method, domestic and foreign databases including SID, Meg Iran, Jahan-e-Islam, Pabmad were analyzed using a combination of virtual, semi-virtual, integrated, and keyword phrases. At this stage, 115 articles were obtained, from which 203 items related to integrated education were extracted.

Step 2: Item reduction

The items extracted from the content analysis were emailed to a number of specialists in the field of curriculum planning and nursing. In this stage, similar and sometimes repetitive items of the previous stage were removed or merged and some phrases and words were revised and corrected. After the changes, the initial questionnaire with 162 items was prepared for psychometrics.

Step 3: Formal validity and content validity:

In order to evaluate the face validity qualitatively, the items of the questionnaire were examined in terms of difficulty, appropriateness and ambiguity. In this stage, there were ten nursing faculty members and five curriculums planning faculty members who presented their corrective opinions. To determine the validity of the content, a questionnaire was given to 15 faculty members in the field of nursing and curriculum planning to express their expert opinions on the observance of grammar and use of appropriate words, placement of items in their proper place. In this section, participants were asked to comment on the need for each item in the questionnaire (content validity ratio) based on a 3-part Likert scale (necessary-useful but not necessary, and not necessary).

Step 4: Structural validity:

We used the exploratory factor analysis as a common method to determine the validity of the questionnaire structure. Various methods have been mentioned to determine the sample size for performing the analysis factor. For example, sources have shown at least three examples per item. However, in special circumstances where there is limited access to the sample, the sample size required for factor analysis is considered to be at least 150 sufficient (source). However, questionnaires were sent to all faculty members of the mentioned universities, and finally 165 questionnaires were completed by faculty members.

Step 5: Reliability:

Internal consistency emphasizes the uniformity of the components of a questionnaire. In this study,

the reliability was examined by internal consistency method (Cronbach's alpha).

We considered the right of each participant to choose to accept or reject participation in the study and ensure about the confidentiality of personal information and confidentiality. The findings will also be published anonymously and in groups.

Results

The number of items in the questionnaire reached 130 items after face validity. In the content validity stage, based on the table of contents and according to the number of participants, 18 items were removed from the items that had a CVR less than 0.51. The correlation matrix showed that many of the coefficients above the acceptable coefficient were 3.

The result of Meyer Eklin's Kaiser Test was 0.737, which is higher than the acceptable level of 0.6. The factor analysis of the correlation matrix was confirmed. Factor analysis of the questionnaire and the results of factor analysis by principal component analysis (PCA) method led to the formation of seven factors (domains) with 112 items. A sample of nine items in each domain is provided in Table 1 (Table 1). Pebble results are also shown in Figure 1 that supports the presence of 7 factors (domains). In the reliability study, Cronbach's alpha coefficient of the total 112 item questionnaire was equal to 0.921.

Table 1: An example of items related to the integrated curriculum with the total variance of each domain

Item No	Factor load of each item	Total variance	Item title
		47.978	
Appropriate e-learning content should be prepared in accordance with the correct and standard principles.	0.899		Item 1
Balance the time and volume of classroom and virtual activities.	0.555		Item 9
Combination of face-to-face and online training appropriately.	0.947		Item 10
The design must be flexible and adapt to changing needs.	0.725		Item 20
In online classes, the learner and the teacher must communicate with each other from any place and at a specific time, such as a face-to-face class.	0.737		Item 23
The online student must have access to the curriculum elements at all times.	0.744		Item 24
The integrated curriculum should be evaluated on an ongoing basis.	0.774		Item 30
The initial, middle and end of the semester evaluation must be considered.	0.663		Item 32
Learners, teachers and technology tools must be constantly evaluated.	0.654		Item 33
Facilities and conditions Total variance			
Technological infrastructure (e.g., telecommunication infrastructure systems, networks and Internet service providers, bandwidth) are required.	0.871	18.680	Item 38
Setting up a virtual education system requires technical and support staff, technical and educational designers.	0.705		Item 50
Integrated learning, like any other major change in the business and educational environment, requires executive support.	0.767		Item 52
Online course teachers should be empowered for support.	0.915		Item 53
It is necessary to consider a support system for teachers who are experiencing integrated learning for the first time.	0.746		Item 57
Educational activities Total variance			
The teacher should use asynchronous tools to design a variety of learning activities to suit learners.		14.276	Item 58
Before teaching, the teacher should decide on the duration of the simultaneous session, the day of the session, the time and time of the session in the day and the geographical areas of the learners.			Item 62
Factor technology is used for more adaptation and coordination in learning and teaching approaches.			Item 68

Learning content should be conveyed to the learner in the form and image that is most appropriate for them.			Item 75
Simultaneous and asynchronous access to learning resources and curriculum should be possible.			Item 84
In the online learning environment, it is possible for the student to communicate simultaneously and asynchronously with different people and resources.			Item 85
Evaluataion Total varaiance			
Preparing a scientific article is one of the evaluation strategies.		13.771	Item 93
A percentage of the total assessment score should be assigned to each student's virtual and non-virtual participation.			Item 94
An electronic portfolio must be created.			Item 95
Various methods and tools should be used in evaluation (types of tests).			Item 98
Self-examination should be performed.			Item 101
Students measure their progress by receiving feedback from the program.			Item 106

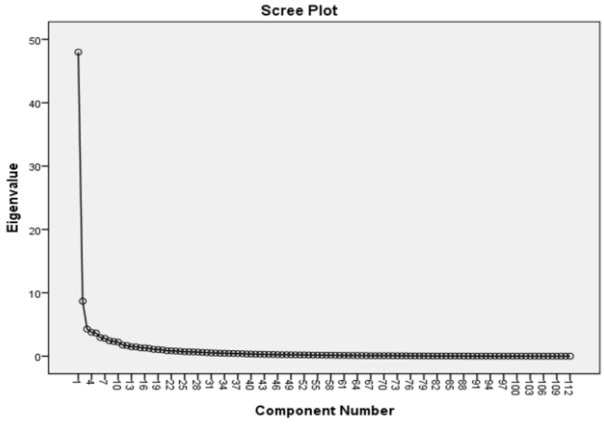

Figure 1: Pebble diagram of the number of factors of integrated education from the perspective of nursing faculty members

Discussion

This study was conducted to create and psychologically measure the feasibility of integrated education tools in nursing from the perspective of faculty members. The above questionnaire can be considered as a new apporach in Iran because its main structures have been extracted and identified from the perspective of nursing experts by the method of content analysis approach. In this study, after the instrumentation stages, we obtained four dimensions (scope) of educational content, context and conditions, educational activities, and evaluation.

The first dimension of the questionnaire is "educational content" including content objectives (curriculum content and resources, balance between classroom and virtual activities, attention to learners' educational needs) and "flexibility" (curriculum flexibility, time flexibility, Spatial flexibility) and "control and evaluation" (course evaluation, teacher evaluation). To design a program, we should consider the content content analysis (learning needs), learner analysis (learning objectives). Intergrated training enhances active learning and communication between learners and provides the ability to adapt to learners' circumstances. Intergrated training classes give students the flexibility to do some of their learning activities individually at any time and place and provide the right educational opportunities at the right time and place for everyone. These findings are consistent with the findings of similar studies in this field. Sidi and Yaghoubi (2012), Savari and Fallahi (2017), Lane (2008), Seraji (2008), Nizam Abadi et al. (2014), Ajam et al. (2013), Salehi Imran and Salari (2012) Hao and Barich (2010). In the educational content, Sidi and Yaghoubi paid attention to the opinions of experts and needs assessment of the

field [11] regarding the importance of the content goals of the riding and welfare curriculum in relation to the resources of the learning topic [19]. Lane mentioned the variety of methods of presenting content and thus meeting the diverse needs of learners [20]. Seraji emphasized on updating and encouraging learners to work continuously, providing evaluation opportunities, and fitting resources with the overall objectives of the curriculum [21]. Nizamabadi et al. paid attention to improving clinical skills and transferring the learned to the clinical field [22]. Regarding the flexibility of Ajam et al., Intergrated training increases the effectiveness and quality of training due to its flexibility in the time and the place [23]. Regarding humanity and flexibility [24], Hao and Barich (2010) focused on evaluating the online learning environment (inputs, activities or transactions and outputs) [25].

The second dimension obtained in this questionnaire was related to "context and conditions", which included "technological capabilities" (i.e., technological skills, technological infrastructure) and "support system" (i.e., educational support, technical support). A prerequisite for using Intergrated training is the presence of the necessary contexts. Regardless of these infrastructures and standards, this type of learning fails to achieve its goalsSetting up a Intergrated training system requires technical and support staff, technical and educational designers, faculty members, students, planners and managers as the main users and actors of the Intergrated training system. Also, having extensive knowledge of skills familiarity with computer, scientific journey on the web instead of aimless web surfing, familiarity with software, troubleshooting and debugging and new attitudes, and change of mindset and understanding of all the factors involved. Working and rebuilding roles, relationships, and ways of doing things are essential. These findings are consistent with the findings of similar studies in this field. Afyooni et al. (2012), Mahmoudi et al. 2016, Hashemi Nejado et al. (2013), Moradi et al. (2011), Vafaie et al., 2009), Yaghoubi (2010), Lee et al. (2011), afyooni et al. who set up a virtual education system and paid attention to technical and support staff, technical and educational designers, faculty members, students, planners and managers [26]. Mahmoudi et al. paid attention to hardware and software facilities [27]. Hashemi Nejado et al. examined access to computers and the Internet at sufficient speed. Existence of sufficient network with sufficient bandwidth [28]. Moradi et al. considered personal, infrastructural and equipment barriers, economic, managerial and organizational as the most important factors hindering the development and application of integrated education [29]. Vafaie et al. considered the appropriate context for virtual education as the most important factor in not using this educational method [30]. Yaghoubi identified the appropriate educational content, the availability of information and communication technology infrastructure, the use of software, and the selection of appropriate educational media, as factors affecting the success of the e-learning system [31]. Lee and Bruges paid attention to the provision of a support system to provide the necessary guidance to the [32] students on an ongoing basis.

The third dimension of the "Teaching-Learning" questionnaire, which includes "teaching activities" (including teaching strategies, optimal combination of education with technology, guidance and support) and "learning activities" (including various interactions, use of simulation programs, self-centered learning, Simultaneous and asynchronous (integrated) learning). Integrated education gives educators the opportunity to design education based on different learning styles and student interests. In fact, integrated education is an intelligent combination of educational methods that any student with any level of knowledge and familiarity with the curriculum can use the features of self-guidance in this education. Integrated education learning increases student-faculty and student-student interactions. Students became more interested in communicating using electronic media. On the other hand, online education allows students to have unlimited access to educational materials, spend more time, compensate for their backwardness, and pursue education according to personal taste. These findings are in line with the findings of similar studies in this field, such as (Seraji, 1394), Goldberg and Pilkington (2007) Avalus (2011) Rosette, and Farzi (2006), Valitan (2002). Seraji posited that the teacher should decide on the duration of the simultaneous

session, the day of the session, the time and time of the session per day, and the characteristics of the learners' geographical areas [33]. Goldberg and Pilkington examined that the major roles of virtual teacher; Establishing social relationships, facilitating discussion, providing feedback, managing the learning process, participating in the discussion, organizing learning activities, initiating discussion, and introducing more resources for study are often done through asynchronous communication [34] According to Avalus, virtual teacher provides integrated training via communication tools at the same time, such as virtual classrooms, video conferencing, and voice chat tools [35]. Rosette and Farzi found that integrated education provides multiple opportunities for communication, collaboration, interaction, and learning control. According to [36] Savari and Fallahi, integrated education makes it possible to simulate highly complex practical activities in a computer environment to teach the subject to learners at a lower cost, time, and risk. Valitan used integrated education to describe learning activities based on a variety of events, such as face-to-face learning, live e-learning, and self-centered learning [37]. As Frank would posit, giving effective and efficient instruction provides combining online instruction with basic face-to-face interactions in the classroom [38].

The fourth dimension introduces the "Evaluation" questionnaire, (e.g., performance feedback including class and research activities, assessment and testing) and "evaluation methods" (i.e., comprehensive assessment, self-evaluation). Online education is a successful and efficient system if the educational content is properly compiled and evaluated. Principles that appear to be relevant to student evaluation include; Giving students the opportunity to self-evaluate specialized subjects, emphasizing continuous evaluation as part of the process of learning specialized problems and issues, emphasizing problem solving as part of evaluation, paying attention to the evaluation of specialized subjects by classmates, using evaluation to improve, eliminating the shortcomings of students' learning in specialized subjects, evaluating students' group activities on specialized subjects, emphasizing the evaluation of students' creativity, and innovation in specialized subjects. Using the various methods and tools of these findings is consistent with the findings of similar studies.Borang et al. (2015), Hasin et al., 2009). Ajam (2017). Borang et al. pay attention to individual differences and the needs of learners, problem solving, creative thinking and other high-level cognitive skills, which are usually helpful [39].

Hasin et al. considered constructive and timely feedback by the virtual instructor to be important in integrated teaching [40]. Ajam considered the following as important in integrated education: writing scientific articles, case studies on specialized issues, presenting methods for doing things (solutions) on problem solving, designing precise questions, conducting individual and group research projects, and e-portfolio [22].

One of the limitations of this study is that it was conducted in the period of 2000-2018 in the field of nursing, so we should be wary of generalizing the results to other fields. In conducting the questionnaire, the researcher faced restrictions and the respondents' refusal in distribution and collection. It is suggested that a similar study be conducted in other fields of medical sciences and in different time periods.

Conclusion

Due to the increasing progress of science in the field of nursing and that the field of nursing is a combination of theoretical and clinical sciences, we need to use Intergrated training in this field. The current study in the form of a integrated study was able to design a tool with 112 items in 4 dimensions of educational content, context and conditions, teaching-learning and evaluation, which can be used for policy makers, administrators and even professors in this field, so they could evaluate their teachings.

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Conflict of interest

Authors declare no conflict of interest in this study.

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