RESEARCH ARTICLE

Designing and validation of a professional autonomy questionnaire for clinical nurses

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Abstract

Background: *Autonomy is a major element of professional practice in nursing and an important factor in improving the quality of patient care. This study aimed to design and validate a questionnaire to assess the professional autonomy of clinical nurses.*

Methods: *This study utilised an exploratory sequential design in three stages. In the first stage, the constructive themes of the concept of nurses' professional autonomy were determined using a meta-synthesis. In the second stage, semi-structured individual interviews were conducted with 19 nurses, and analysis was performed using the deductive content analysis method. Finally, a methodological study was conducted to design and validate the clinical nurses' professional autonomy questionnaire by testing for face, content, and structural validity. Reliability of the questionnaire was calculated by examining internal consistency and stability.*

Results: *Based on the first and second stages, the initial pool of the questionnaire of 99 items was designed. The content validity index for the entire questionnaire was 0.964. For exploratory factor analysis, 250 nurses were included using the convenience sampling method. Varimax rotation and maximum likelihood methods were used to extract the factors. Finally, the clinical nurses' professional autonomy questionnaire with 31 items and seven dimensions including "professional care", "professional mutual respect", "professional decision making", "leadership role", "professional discipline", "clinical skills" and "critical thinking" was developed with a 5-point Likert scale. The reliability was confirmed by Cronbach's alpha coefficient of 0.885, and the stability was confirmed by the intra-cluster correlation coefficient of 0.840.*

Conclusions: *According to the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) criteria, the present questionnaire has desirable psychometric properties and is the first questionnaire specifically designed in Iran to assess professional autonomy in clinical nurses with applicability in different clinical departments.*

Keywords: *professional autonomy, nurse, qualitative study, meta-synthesis, validation*

Introduction

Autonomy is a key element of professional practice in nursing and an important aspect of professionalisation [1]. The ability to make independent decisions based on comprehensive knowledge, clinical expertise, and evidence-based findings is a hallmark of professionalism [2], which is an example of autonomy. Professional autonomy in nursing refers to the right to make clinical and organisational judgements within a healthcare team framework and by field regulations [3-5]. Autonomy is required to achieve better results in decision-making to establish and maintain patient safety, decision-making to increase the quality of patient care, reduce patient mortality, decrease stress and increase job satisfaction, retain, and attract nurses [6-8]. Professional autonomy allows nurses to make timely decisions at the patient's bedside. On the other hand, creating autonomy in nurses' activities is necessary to gain trust, respect, skills and competence, in communication with other colleagues and physicians [9,10].

Since the 1980s, the concept of autonomy in nursing has been one of the most important issues globally. To increase the professional autonomy of nurses, some efforts have been made to bring about changes in nursing education and in the workplace. Following such efforts, tools are required to measure this characteristic of professionalism [11]. The lack of specific tools is one of the challenges of professional autonomy in nursing that has been mentioned in the literature. On the other hand, various factors such as customs, religious, economic, political, social, and cultural factors affect professional autonomy in nursing, which may vary in each country. Nurses' autonomy is not a fixed entity but varies according to the situation and factors such as organisational rules and regulations or personal and individual factors [5]. Therefore, it seems necessary to have a local and specific tool to measure professional autonomy to improve the professional status of nurses, resolve inter-professional conflicts, promote professional socialisation, and help health planners and policymakers.

In this regard, the research related to the concept of professional autonomy showed that a native tool that is suitable for the field of professional nursing has not been designed in Iran and only foreign tools have been used in the studies conducted by Iranian researchers. On the other hand, in none of them have the validity and reliability of the tool among Iranian nurses been studied. Even some of the tools used in the studies have been non-specific tools related to the nursing profession [12-14]. One of the limitations of some existing scales in the field of professional autonomy is that the concept of professional autonomy is combined with other fields [6].

In none of the existing tools are the dimensions of professional autonomy in nurses mentioned, and they only provide a general score and determine the level of autonomy. On the other hand, in some existing questionnaires, professional autonomy is one of the sub-scales, and as a result, none of the available tools have addressed the specific dimensions of professional autonomy in nurses such as clinical competency, decision-making, etc.

Further, most of the tools in use are related to older concepts of professional autonomy, which have been evolving over time. In this regard, Colton argues that when our meaning and perception of a structure change over time, a tool designed to measure a structure at one point in time may not provide valid measurements at another time [15]. Changes occurring in the image of nursing over the years, associated with increasing professional autonomy and the development of new definitions of professional roles and functions, need to be considered, as also that the concept of professional autonomy can be affected by various factors such as organisational, individual, and social factors [5-6,16], The designing of a local and up-to-date tool, inclusive of these changes and professional developments in the field of nursing in recent years is necessary. Now, considering that there is no special tool for measuring the professional autonomy of clinical nurses in Iran, there is a need to design a valid and reliable questionnaire applicable to the culture and working conditions of Iranian nurses. Therefore, the purpose of this study is to design and validate the clinical nurses' professional autonomy questionnaire.

Methods

This study utilises an exploratory sequential mixed methods approach, extracted from a nursing doctoral dissertation. The study was conducted from July 2018 to February 2019. This study was conducted in three stages: qualitative meta-synthesis, conductive content analysis, and tool validation. The results of the meta-synthesis study have been published as an article in another journal [17]. However, this article describes the results related to the second and third stages of the study.

In the first stage, according to the literature review, which showed the existence of several qualitative studies on the concept of autonomy in nurses, it seemed that the most appropriate method that can reveal a comprehensive view of all aspects of the phenomenon is the qualitative meta-synthesis method. Noblit and Hare's meta ethnography approach was used for qualitative meta-synthesis [18]. In general, the main framework related to the concept of professional autonomy in nurses was determined at this stage [17].

In the second stage, to complete the conceptualisation and also to emphasise the design of native tools arising from the cultural and social context of Iranian nurses, conductive content analysis was used. Therefore, the participants in this study were selected from among clinical nurses, professors, and managers of nursing if they met specific criteria including nurses working in clinical departments, having at least two years of clinical experience, and willingness to participate in the study. After obtaining a research licence from the Ahwaz University of Medical Sciences, participants were selected based on purposive sampling and in some cases, based on snowball sampling. To increase the diversity of data, samples were selected from different departments such as medical-surgical, paediatric, emergency, etc. Also, they were selected from different hospitals and with different work backgrounds and positions (including clinical nurses, head nurses, nursing supervisors, nursing managers, and faculty members of nursing). Data were collected through semi-structured interviews. Data analysis was performed based on the Elo and Kyngas method [19] using MAX QDA10 software.

In the third stage, based on a qualitative study, the operational definition of the concept of professional autonomy of nurses and its dimensions were determined and the items were presented by categories and dimensions. Also, to enrich the item repository, a review of other existing nurses' autonomy questionnaires was performed. Then, the initial blueprint was reviewed several times. Eventually, the final blueprint including the operational definition of the concept of professional autonomy of nurses was designed and psychometric evaluation was performed to test various forms of validity such as face, content, and construct validity and then reliability, by examining internal consistency and stability. It should be noted that different participants were used in all the validation stages of the tool, who were selected using convenience sampling method.

Face validity was calculated by examining the item impact coefficient (impact score greater than 1.5) through face-to-face interviews with 10 nurses [20]. Through a survey of 13 experts, the content validity ratio (CVR) based on the Lawshe table (CVR> 0.54), content validity index (I-CVI> 0.78 and S-CVI/Avg> 0.9) and kappa statistic (Kappa> 0.74) were calculated [21].

Item analysis was performed to further assess the validity of the questionnaire. Initial reliability was assessed using the internal consistency method with a sample size of 50 people who were selected from among clinical nurses. At this stage, the item that did not have a correlation coefficient of more than 0.3 with at least two other items of the questionnaire was removed. In the cases where the correlation coefficient between the two items was more than 0.7 and had a content relationship with each other, one of the items was removed. If there was a correlation coefficient of less than 0.3 between the item and the entire questionnaire, the item was deleted [20].

An exploratory factor analysis method based on the five-step guide of Williams et al was used to evaluate the construct validity [22]. Therefore, at least five clinical nurses per item

(250 participants in total) were included in the study by a non-probability sampling method with maximum diversity in terms of individual and social variables.

To evaluate the suitability of the data for factor analysis, the sampling adequacy was obtained from the Kaiser-Meyer-Olkin sampling index (KMO), and for assessing the adequacy correlation between the items of the questionnaire, the Bartlett's test of sphericity was used [23]. Due to the normality of the data, the maximum likelihood method was used. To extract the factors having a special value of more than one, the location of the factors outside the horizontal line consisting of sand and explaining at least 50% of the variance of the concept by the extracted factors were the basis of judgment [22]. On the other hand, assuming the factors were independent, the varimax method was used and the minimum acceptable factor load for the items was considered 0.4. In the last step, it was decided to place the items in the extracted factors and name them [22].

A questionnaire was provided to 30 nurses to assess internal consistency with Cronbach's alpha coefficient. In general, the alpha value should be at least 0.7 or more for a question to remain in the questionnaire. To evaluate relative stability, the test was performed on 30 clinical nurses, and after 2 weeks, a re-test was performed again on the same group. Also, the intra-cluster correlation coefficient (ICC) was used to calculate the reliability coefficient, which was considered as 0.7 [20].

For absolute stability analysis, the standard error of measurement (SEM) was calculated [20], and to determine the response, the minimal detectable change (MDC) was calculated [24].

Based on the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) checklist to determine interpretability, calculating the effect of ceiling and floor effect was used [25]. First, the total score of the questionnaire and each of its dimensions was set between zero and 100, and then it was determined what percentage of participants (n = 250) scored zero or 100.

To determine the feasibility of the questionnaire, the average time of completion of the questionnaire was used. The average time to complete the questionnaire was 10 minutes (ranging from 5 to 15 minutes).

The clinical nurses' professional autonomy questionnaire has options with a 5-point Likert scale (always = 5, often = 4, sometimes = 3, rarely = 2, and never = 1). To better understand the scoring and comparability of the scores of the questionnaire subscales, the standardisation method of 100 was used and the scores of each scale and the entire questionnaire were converted from zero to 100 using the following linear conversion formula [26]. The weight of the items was also applied to the scoring.

$$\textbf{Score}\ (\%) = \frac{\text{earned raw score} - \text{total minimum score}}{\text{total maximum score} - \text{total minimum score}} \times 100$$

Finally, based on these three stages of the study, the final version of the questionnaire was designed in the form of 31 items.

Ethical considerations

The present study was approved by the ethics committee of Ahvaz Jundishapur University of Medical Sciences, Iran (IR.AJUMS.REC.1397.286) in 2018. Also, before each interview, written informed consent was obtained from the participants.

Results

Qualitative meta-synthesis

At this stage, the final interpretation of the phenomenon of professional autonomy of clinical nurses was presented in the form of three themes (third-order constructs) namely, professional competencies, professional decision-making, and effective interactions, and 12 categories (second-order constructs). The findings of the meta-synthesis study are presented in the Supplementary Table 1 (available online only) [17].

Deductive content analysis

During the data analysis process, 451 initial codes were derived based on similarities and differences in 20 sub-categories, and 10 generic categories, which were then classified into four main categories: professional power, clinical reasoning, effective professional interactions, management and leadership abilities. The main category of management and leadership abilities is one of the newly emerged categories, which is a result of combination of two generic categories — management skills and leadership ability. The participants stated that having a series of management characteristics such as organisation, supervision control, and guidance as well as having leadership power among the treatment team are requirements for professional autonomy in nursing. The findings of this stage, including subcategories, generic categories, and main categories based on deductive content analysis, are shown in Table 1. Based on the qualitative study, the operational definition of the concept of professional autonomy was derived as, "A nurse with professional autonomy is a person with professional capabilities and management and leadership capabilities who provides adequate nursing care using clinical reasoning and effective professional interactions."

Finally, the initial questionnaire containing 240 items was designed, of which 51 items were extracted from related tools about professional autonomy of nurses. The questionnaire was then reviewed and refined by the research team in five stages, and then, the final questionnaire consisting of 99 items was entered into the validation stage.

Table 1. Sub-categories, generic categories and main categories based on deductive content analysis

Sub–categories	Generic categories	Main categories
Professional knowledge	Professional competence	Professional powe
Clinical skills		
Professional values and attitudes		
Independence in duties	Freedom of action	
Independence in critical situations		
Patient and family support	Supportive nurse	
Colleague support		
Self Confidence	Self–reliance	
responsiveness		
The power to make decisions regarding the patien	The power of clinical decision–making	Clinical reasoning
Informed decision making	Evidenced based decision–making	
Reasoning power		
Team behaviour	Team work competence	Effective professional interactions
Doctor and nurse communication	Effective professional communication	
Communication with othe treatment team		
Communication with the client		
Supervision	Management skills	Management and leadership abilities
organize		
Control and guidance		
Leadership power		

Quantitative stage (validation)

Determining validity

Based on face validity and content validity, the number of items was reduced from 99 to 50 items. Also, the S-CVI/Avg index of the questionnaire was determined to be 0.964, which is considered as an excellent standard among toolmakers.

Item analysis

The internal consistency of the questionnaire in the pilot study was calculated by Cronbach's alpha coefficient of 0.968. Also, the correlation coefficients between items and the entire questionnaire were not less than 0.3 and all items had a correlation coefficient of more than 0.3 with at least one other item of the questionnaire. None of the items had a correlation coefficient higher than 0.7.

Factor analysis

Finally, 50 items entered the construct validity stage. In this study, KMO was considered as an indicator of sampling adequacy (0.926). The significance of Bartlett's test of sphericity also indicated the ability to classify items and the formation of factors. Based on the total variance table explained by the factors, it was shown that seven factors have a specific value of more than one. The scree plot drawn from the factors also showed the seven factors which are outside the horizontal line composed of scree (Figure 1, available online only). These seven factors explained 52.95% of the variance of the concept and labelling of each factor as shown in Table 2. The factor naming process was performed as the last step of factor analysis. The demographic characteristics of the samples in the construct validity stage are presented in the Supplementary Table 2 (available online only). The mean (standard deviation) age of the participants was 34.7±90.74 years and their mean (standard deviation) work experience was 11.7±33.38 years.

Determining reliability

Cronbach's alpha value for the whole questionnaire was 0.885 (Table 3). To evaluate relative stability, the intra-cluster correlation coefficient of the entire questionnaire was 0.840. The SEM was 3.941. The relative and absolute stability of the professional autonomy of clinical nurses questionnaire (PACNQ) is shown in Table 4.

Responsiveness

Considering that the percentage MDC of the total questionnaire in the present study is less than 10, it is considered excellent.

Interpretability

The ceiling and floor effects for the entire questionnaire and in factors 1, 2 and 4 was less than 15% and desirable. But factor 4 had a ceiling effect of more than 15%. Based on these results, the interpretation of the scores obtained from this questionnaire can distinguish nurses with the minimum and maximum degree of professional autonomy.

Feasibility

The average time taken to complete the questionnaire was 10 minutes.

Scoring

Finally, using the linear conversion formula, a score between 0 and 100 was obtained. A score of zero means "no professional autonomy" and the higher the score, the higher the degree of professional autonomy.

Discussion

In general, the results of the study exploring the concept of professional autonomy of clinical nurses showed that a nurse with professional autonomy is a person with professional power in providing patient care, who can make informed decisions about patients by his/her capacity for clinical reasoning. Such a nurse, through her/his professional interactions with the treatment team, can establish effective

Table 2. Labelling each factor based on the relevant items by factor loading

No	Items	Factor loading						
		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7
1	I update my professional knowledge.	0/574						
2	I examine different aspects of the patient's health to provide care.	0/564						
3	I use innovations to better implement patient care.	0/540						
4	Based on the evaluation data, I write a care plan for my patient.	0/615						
5	I educate my patient independently during the whole period of hospitalization and discharge.	0/523						
6	I calm the patient and his family in critical situations.	0/443						
7	I am appreciated for my successful and independent performance.		0/545					
8	Physicians consult with me in clinical decisions.		0/653					
9	In clinical rounds, my position as a nurse along with physicians is defined.		0/550					
10	Other colleagues consult with me about the patient care and treatment process.		0/520					
11	According to my performance, physicians support me when needed.		0/732					
12	Physician trust me as a competent patient caregiver.		0/528					
13	My opinion will be asked in designing the work plan.		0/495					
14	I independently begin the initial life-saving cares, in the event of an emergency until the physician arrives.			0/645				
15	I take responsibility for my own decisions.			0/547				
16	I have the ability to make the right decisions in the patient’s bedside.			0/520				
17	In making decisions, I pay special attention to the patient's clinical condition.			0/619				
18	32- I am able to prioritize the necessary measures to save the patient's life.			0/492				

19	I have high self-confidence in performing my professional duties.				0/424			
20	I am able to create a good coordination between the members of the treatment team.				0/454			
21	I have the ability to manage emergency situations.				0/502			
22	I have the power to influence the decisions and actions of others.				0/775			
23	50. Given the power I have in managing the patient, others count on my words.					0/650		
24	I try to be honest in my work environment.					0/405		
25	I am serious and precise in performing my professional duties.					0/893		
26	Others know me as a disciplined person.					0/534		
27	I have enough clinical skills.						0/618	
28	I have the necessary experience and knowledge for independent nursing performance.						0/545	
29	I can provide a proper nursing diagnosis according to my patient's problems.							0/420
30	After each shift, I think about my actions.							0/608
31	I critically evaluate mistakes made by myself or my colleagues.							0/458

Note: *Factor 1:"professional care", Factor 2: "professional mutual respect", Factor 3: "professional decision making", Factor 4: "leadership role", Factor 5: "professional discipline", Factor 6: "clinical skills" and Factor 7: "critical thinking"*

communication in the clinical setting and also develop management skills and leadership ability in the team. Although the findings of the present study are in line with the themes of other studies, the point to consider in this study is the emergence of the category of "management and leadership abilities", which is not mentioned in any of the other studies. The reason for this difference seems to be the cultural background as well as the difference in organisational characteristics. As mentioned before, the autonomy of nurses is not a fixed concept, but varies according to the situation and influential factors such as organisational rules and regulations, or individual factors [6]. It seems that the overlap of roles in nursing in Iran and in other settings, the assignment of non-nursing tasks to nurses can create a desire to acquire management skills in nurses so that they can use these skills such as organisation, control, etc, to take steps in line with the independent and efficient implementation of assigned tasks. Also, considering that the movement towards professionalisation in Iranian nursing has been growing stronger in recent years, it seems that in this regard, Iranian nurses need to gain leadership capacity to

Table 3. Cronbach's Alpha coefficient by dimensions and the whole inventory

Factor	No. of items	Cronbach's alpha Coefficient
Factor 1	6	0/723
Factor 2	7	0/699
Factor 3	5	0/790
Factor 4	5	0/836
Factor 5	3	0/847
Factor 6	2	0/827
Factor 7	3	0/817
Total	**31**	**0/885**

Note: *Factor 1:"professional care", Factor 2: "professional mutual respect", Factor 3: "professional decision making", Factor 4: "leadership role", Factor 5: "professional discipline", Factor 6: "clinical skills" and Factor 7: "critical thinking"*

Table 4. The relative and absolute stability of Professional Autonomy of Clinical Nurses Questionnaire (PACNQ)

Factor	Mean	SD	ICC	95% CI	P Value	SEM
Factor 1	39/333	2/835	0/834	0/654-0/921	P<0/001	1/155
Factor 2	26/016	4/392	0/881	0/751-0/943	P<0/001	1/515
Factor 3	23/049	2/016	0/730	0/433-0/872	P<0/001	1/047
Factor 4	21/833	2/127	0/862	0/714-0/934	P<0/001	0/790
Factor 5	14/716	1/585	0/933	0/859-0/968	P<0/001	0/410
Factor 6	8/999	0/981	0/814	0/608-0/912	P<0/001	0/423
Factor 7	12/783	1/637	0/828	0/640-0/918	P<0/001	0/678
Total	**132/5**	**9/853**	**0/840**	**0/664-0/924**	**P<0/001**	**3/941**

Note: *Factor 1:"professional care", Factor 2: "professional mutual respect", Factor 3: "professional decision making", Factor 4: "leadership role", Factor 5: "professional discipline", Factor 6: "clinical skills" and Factor 7: "critical thinking", SD: Standard Deviation, ICC: intra–cluster correlation coefficient, CI: Confidence Interval, SEM: Standard error of measurement.*

create and exert influence among the treatment team, to guide the team to implement the patient's health goals, as one of the components of professional autonomy.

Finally, based on the results of the quantitative study, a valid and reliable questionnaire called the Professional Autonomy of Clinical Nurses Questionnaire (PACNQ) encompassing seven factors including "professional care", "professional mutual respect", "professional decision-making", "leadership role", "professional discipline", "clinical skills" and "critical thinking" were designed with 31 items. The questionnaire was designed based on the operational definition obtained from the qualitative study as well as a review of tools related to autonomy and finally entered the validation stage. According to the results of the validation by COSMIN criteria, it can be said that PACNQ is a tool with desirable validity and reliability indicators.

The questionnaire in the first dimension called "professional care", includes phrases related to a set of nurses' efforts to provide the best client-centred care. The second dimension of "professional mutual respect" focuses on nurses gaining the trust and respect of the treatment team, especially of physicians, based on successful work experience. The third dimension entitled "professional decision making", examines the nurse's ability to make decisions in clinical situations and his/her responsibility for the decisions made. The fourth dimension entitled "leadership role", refers to the nurse's leadership ability in the situations that arise and the leadership of the treatment team. The distinguishing point of the present questionnaire compared to other tools in the same dimension, is that in none of the available tools, is the role and position of the nurse leadership seen as one of the important features of the concept of professional autonomy of nurses discussed. This seems to be due to the obsolescence of existing tools. Because of the professionalisation of nursing in recent years and the promotion of the position of the nurse within the treatment team, leadership ability is considered one of the important dimensions of autonomy in nursing these days. In the fifth dimension entitled "professional discipline", some professional values and attitudes such as discipline, honesty, and seriousness are examined. These concepts are not mentioned in any of the available tools, and it seems that the reason for this is the difference in cultural and social conditions prevailing in the study community. The sixth dimension "clinical skills" is related to knowledge, skills, and experience which are also considered necessary for independent performance. One of the limitations of the present questionnaire is the small number of items in this dimension (only two items). Despite this point, the importance of the content of the items and the acquisition of a factor load above 0.5 were decided upon by the research team. In the seventh dimension, the nurse's power of logical thinking and critical evaluation are examined.

In the present study, considering that general and specific tools have been designed to assess the professional autonomy of nurses in other countries, these tools were compared with the present questionnaire based on the COSMIN checklist. In studies on other tools related to autonomy, the formal validity of the tools has not been mentioned. Also, in only a few of them, content validity was based on the opinions of the panel of experts, and only the amount of CVI was mentioned. Whereas CVR and S-CVI / Avg were not reported in any of the available tools. However, in the present study, in addition to CVR and CVI, the average content validity index was calculated as 0.964, which indicates the excellent content validity criteria of the present questionnaire.

In our study, the construct validity was investigated through exploratory factor analysis. Among the available tools, the construct validity is usually examined using one or two methods including factor analysis, convergent and divergent validity or known groups, and a multi-trait-multimethod matrix. In a study by Weston, the results of factor analysis of the Schutzenhofer nursing professional autonomy scale showed that this tool explains only 27% of the total variance of the concept of autonomy [27]. Exploratory factor analysis in the present study confirms the construct validity of the clinical nursing professional autonomy questionnaire and shows that seven factors of this questionnaire can explain 52.95% of the total variance, which is an acceptable percentage of variance.

In reviewing the results of the relative stability in the available tools, it was observed that only in the Pankratz nursing questionnaire and the Schutzenhofer nursing professional autonomy scale, the retest method was used. In the Schutzenhofer nursing professional autonomy scale, the intra-cluster correlation coefficient of the whole questionnaire was 0.68, which indicates the unfavourable reliability of the tool.

We also examined the responsiveness and interpretability of the professional autonomy of clinical nurse's questionnaire, while these criteria are not reported in any of the available tools. On determining the ease of use of the questionnaire in the present study, we noted that it took 10 minutes to complete it, which is a good time. Because long questionnaires can reduce the desire of the target group to complete questionnaires or may reduce the accuracy of the answer.

In the nursing autonomy questionnaire designed by Pankratz, the content of the questionnaire was based on this definition of the concept that nursing autonomy included the completely independent performance of a physician [14]. In the new conceptualisation of autonomy, the role of interactions and inter-professional cooperation in practice is mentioned, because providing care services requires teamwork [28]. On the other hand, the Pankratz nursing questionnaire has three subscales that deal with the concept of nursing autonomy in only one subscale. It seems that this questionnaire cannot comprehensively assess the concept of professional autonomy in nurses given the narrow definitions of this concept in the literature.

The Caring Perspective was designed by Boughn et al to measure clinical autonomy. However, the content of the questionnaire does not fully correspond to the definition of clinical autonomy. This tool has four subscales: attention to others, attention to oneself, support and activity for others, and support of one's activity [12]. In the Boughn questionnaire, only two dimensions of the definition of autonomy, ie "patient support" and "support of the nursing profession", has been addressed. Therefore, it seems that this questionnaire cannot measure the concept of professional autonomy of nurses comprehensively and completely. On the other hand, this questionnaire has been designed specifically for female nursing students.

About the Schutzenhofer nursing professional autonomy scale, case study analysis by Weston showed that a high percentage of respondents reported that they perform similar activities in their units. Given that more than 20 years have passed since the design of the questionnaire, several issues raised in this tool are now considered common tasks and nursing standards, because the standards of practice change over time, and as a result, nurses often state that they perform these activities in their unit [27]. Of course, we could point out that all the available tools are old, while the evidence, shows that concepts are evolving and changing over time and nursing has moved towards greater professionalism. This could be one of the limitations of the existing tools. Also, in the case of the modified nursing workload index, work autonomy has been dealt with only in one of its subscales, which includes five items, and their content is related to freedom in decision making and receiving organisational support [29]. In the autonomy scale designed by Blegen et al, there are two dimensions of patient care decision-making and unit operation decision-making, which focus only on the ability to make independent decisions as an important feature of independent performance [30]. Also, while examining the items of available tools, some of them have been designed for the cultural and social conditions and professional laws specific to a community and in some cases, cannot be applied to the laws and standards of nursing that govern the healthcare system of Iran.

One of the strengths of the present questionnaire compared to other available tools is in terms of the origin of item production. In this study, the extraction of items was done through an inductive-deductive approach. Therefore, one of the strengths of the present questionnaire is that the content of the present questionnaire is taken from a qualitative study, and which is appropriate to the specific cultural and social context of Iranian society.

Considering that the scores of the seven dimensions of the present questionnaire can be combined, resulting in a total score, and the scores of each dimension can be calculated separately. Using the scoring approach with the weighted method can raise the strengths of the present questionnaire. Finally, it can be said that the present questionnaire is a valid and reliable questionnaire that can be used to assess the professional autonomy of clinical nurses in various dimensions.

One of the limitations of the present study was the limitation in the qualitative phase to public education and treatment centres affiliated to medical universities, while other institutions, such as private hospitals, were not included in our study. Other limitations of the present study include the lack of confirmatory factor analysis and convergent validity analysis. The other limitations of the study, include the low

sample size and further research is suggested to conduct studies with a larger sample size in the future to check the effectiveness of the tool. It is also suggested that the confirmatory factor analysis and the convergent validity of the current tool be examined in future studies.

Conclusion

Due to the expansion of the field and the existence of Ph.D. courses, it seems that autonomy has become more pronounced and there is a need to examine the status of the professional autonomy of nurses and determine its strengths and weaknesses. Thus, practical solutions can be proposed to reduce the gap in the status of professional autonomy. Professional autonomy can improve capacity and empowerment in nurses, and as a result, the nurse can be considered as one of the main members of the treatment team, and also the serious responsibility of care and its value can be well clarified. Therefore, we believe that the present questionnaire is designed based on the main and important features of nurses' professional autonomy, and due to its multidimensional examination of the concept of autonomy, it is a suitable tool to accurately measure the professional autonomy in nursing.

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