





BMJ Open What should be measured? Nursing education institutions performance: a qualitative study

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ABSTRACT

Objectives In this qualitative study, we specify important domains of a nursing education institution that need to be measured to represent its performance via students' perspectives, one of the most important stakeholders in higher education.

Setting This study was conducted in a nursing and midwifery faculty.

Participants Participants were bachelor's, master's and Ph.D. students in nursing. Convenience sampling was used. The aim and methods of the study were explained to the students, and they were invited to participate in the focus groups. Four focus groups (n=27) were held.

Results Thirteen categories emerged that were assigned to three components of the Donabedian model. The structure component contained three categories: learning fields, equipment and facilities and human resources standards. The process component contained five categories: workshops for students and staff, student familiarity with the institution's rules and plans, teaching, students evaluation and evaluation of teaching staff by students and peers. And outcome components contained five categories: results of self-evaluation by students, graduates' outcomes, students' outcomes, students surveys results and related medical centres performance.

Conclusion(s) Based on the needs and ideas of this important group of stakeholders, we can proceed further. Once we specify what is important to be measured, then it is appropriate to develop or choose suitable and measurable performance indicators for each of the recognised categories.

INTRODUCTION

Quality essential healthcare services are required to reach the sustainable development goal for health.¹ The increase in development and training of the health workforce in developing countries is also targeted as part of the third goal (target 3c), in the 2030 Agenda for Sustainable Development, by United Nations Member States in 2015.²

Properly educated and trained students in health education institutes can be effective clinical practitioners and decision-makers.³ Nurses, along with midwives, are the largest part and essential members of the health

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ Separating the focus group session of the Ph.D. students, created more homogeneous groups.
- ⇒ About this topic, using focus groups as a means of data collection improved participation.
- ⇒ Those who volunteered to participate in focus groups may be different from others that did not.

workforce.⁴ Nurses have an essential role in the provision and coordination of care, prevention of adverse events, health service productivity and patient outcomes.⁵ Improvements in nurses' and midwives' education are considered an important way to increase workforce numbers and enhance the quality of healthcare and health systems.⁶

Nursing education is responsible for training nurses efficiently,⁶ and the quality of nursing education programmes can contribute to universal health coverage by the production of qualified nurses.⁷ Improving the quality of higher education organisations should be considered an important priority. To achieve this goal, evidence-based evaluation and audit are needed. There are different models and approaches around the world for the evaluation and audit of higher education. Countries develop these models to evaluate educational performance.⁸ Measurement may be the first step to improvement.⁹ Managers can use performance measurement as a powerful tool for evaluating and controlling their organisations.¹⁰ The role of measurement in quality improvement is as important as lab and imaging studies in clinical medicine.¹¹

Decision-makers have developed an understanding that stakeholder engagement and public participation for effective decision-making and greater public acceptance is very essential.¹² Different groups of stakeholders have different goals, needs and priorities and use different criteria. Students are the most



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important stakeholders, and failure in fulfilling their needs and expectations may dramatically affect the operation of higher education institutions.¹³

As a developing country, Iran encounters different nursing challenges such as significant nursing and nurse educator shortage and the ageing of the nursing workforce.¹⁴ In Kalateh Sadati *et al's* study, a weak educational system was recognised as the most important structural deficiency. Participants believed that the nursing educational system does not have a high quality.¹⁵ In Zamanzadeh *et al's* study, one of the challenges was the scientific competency of nurses. The participants mentioned the ineffective preparation of newly recruited nurses and the inadequacy of in-service training among the issues affecting the scientific competency of nurses.¹⁶ It seems that the future nursing of Iran will face many uncertainties.¹⁷

Knowing the defects that exist in nursing education in Iran, and considering the measurement as an effective way for improvement, and also the lack of well-designed systems and criteria for nursing education institutions' performance measurement in our country, we tried to take the first step by gathering stakeholders' perspectives. We guided the data analysis in this study with the Donabedian Quality Improvement Model. Donabedian model, first described by Avedis Donabedian in 1966,¹⁸ is the most widely recognised and comprehensive quality evaluation framework that defines three different aspects for quality that are structure, process and outcome.¹⁹ This model provides a better image of a service. Because instead of focusing on outcomes solely, it moves to understand what has made the outcomes.¹⁸ This model would help us to consider and classify students' perspectives on all aspects of the school.

In this qualitative study, we aimed to specify important domains of a nursing education institution that need to be measured to represent its performance via students' perspectives, who are one of the most important stakeholders in higher education.

METHODS

Design

A qualitative descriptive–exploratory study was conducted. The main purpose of descriptive–exploratory studies is to describe or explore a phenomenon, problem or subject and includes a wide range of questions on individuals' experiences, knowledge, attitudes, emotions, perceptions or views points.²⁰

Setting and samples

This study was conducted in the nursing and midwifery faculty, Tabriz University of Medical Sciences. Tabriz University of Medical Sciences is located in Tabriz, East Azerbaijan Province, Iran. It is ranked as one of Iran's top universities based on the ranking web of universities published in 2021 (ranking=12).²¹ Tabriz University of Medical Sciences operates over 10 teaching hospitals that

provide different kinds of specialised and subspecialised learning fields for students. Tabriz Nursing and Midwifery Faculty is the first nursing training institute in Iran. It was founded in 1996 when the faculty managed to admit nursing students in the Ph.D. programme as the first one in Iran. There are three degrees for nursing in Iran: bachelor, master and Ph.D. A bachelor's degree in nursing is 4 years; a master's degree is 2 years and a doctorate degree is 4 years.

Participants were bachelor's, master's and Ph.D. students in nursing. Tabriz's nursing and midwifery faculty had about 560 bachelor's students, 113 master's students and 24 Ph.D. students in nursing during the sampling.²² Convenience sampling was used. Students in different parts of the faculty (classrooms, campus and dormitories) were being informed about the study and its aims and topic, directly by the researchers themselves or through other instructors, professors or students. They were being invited to participate in the study. Those who were willing to participate were being linked to the focus group's facilitator. The time and place for the sessions would be set and students would attend the focus groups. Inviting participants and holding focus group meetings were done over time and continued until data saturation was reached.

Data collection

Four focus groups were held. Focus groups were designed to obtain the participants' perceptions of a focused topic in a permissive and non-threatening setting.²³ Groups had between 5 and 9 participants. Sessions lasted between 35 and 60 min. Bachelor and master students' focus groups were separated from Ph.D.'s, as we thought that the former may reluctant to speak in the presence of Ph.D.s. They may avoid speaking freely because they may feel inferior in knowledge related to the topic and fear sounding irrelevant. Selecting participants who are similar to one another in lifestyle or experiences, views and characteristics is believed to facilitate open discussion and interaction.²³ One of the researchers herself was the facilitator. Semistructured interviews were used. We tried to keep a comfortable and friendly atmosphere during interviews as participants could speak freely. We had one main open-ended question and some other exploring questions in case of necessity to explore more about the topic. The main question was:

'If we want to know about a nursing education institution performance, what must be measured?'

Sessions were recorded, and further investigation was conducted on the data.

Data analysis

Audio-recorded interviews were transcribed verbatim by the first author. Content analysis was used for data analysis. Content analysis is designed to classify the words in a text into categories. The researcher is looking for repeated ideas or patterns of thought. In exploratory descriptive qualitative studies, researchers may analyse the content

of the text using concepts from a guiding theory.²³ In this study, we used Donabedian's three component quality improvement model. The three components are structure, process and outcome. Donabedian believed that there is a relationship between structure, process and outcome. Good structure will promote good process, and good process leads to good outcome.²⁴ The organising concepts of structure, process and outcome remain central to measuring and improving quality.²⁵

The data analysis process involved reading, re-reading and immersing in data, coding and extracting the categories. Later, these emerged categories were compared and assigned to each of the related three components of Donabedian's Model.

Trustworthiness

To improve the rigour of the study, all the processes of the data collection and analysis were reviewed and checked by two members of the study group. Also codes, categories and assignment of categories to components of the model were discussed in the study group involving four of the authors. Findings also checked with one of the members, and her confirmation was obtained.

Patient and public involvement

Patients or the public were not involved in the design, conduct, reporting or dissemination plans of our research.

RESULTS

Demographic characteristics

Four focus groups (n=27) were held. Participants were 16 (59.3%) female and 11 (40.7%) male. Overall, 77.8%

of the participants (n=21) were studying for a bachelor's degree in nursing, 3.7% (n=1) for a master's degree and 18.5% (n=5) for a Ph.D. None of the participants were transferred from other universities. Overall, 33.3% of participants lived in dormitories.

Components

Thirteen categories emerged as each of the structure, process and outcome components contained three, five and five, categories respectively (figure 1).

Donabedian defined structure as the attributes in and with which care occurs. Process factors as all the acts of caregiving and outcome or results as all the effects of care.²⁶ We used the Donabedian's Model, its components and the definition of components as a framework considering nursing education. In the following, we employed each of the three components, their definitions, related categories and also some quotations from participants.

Structure component

By defining structure as the attributes which in and with the nursing education can occur, three categories were assigned to the structure component (figure 1).

Learning fields

Experiencing different learning fields and learning situations during a nursing course, participants believed, could improve learning. Close observation or managing real patients with different kinds of diseases or conditions that may need various types of care and treatments will provide various types of learning opportunities. Several participants in this study mentioned that they spent their clinical training hours in the same departments of the

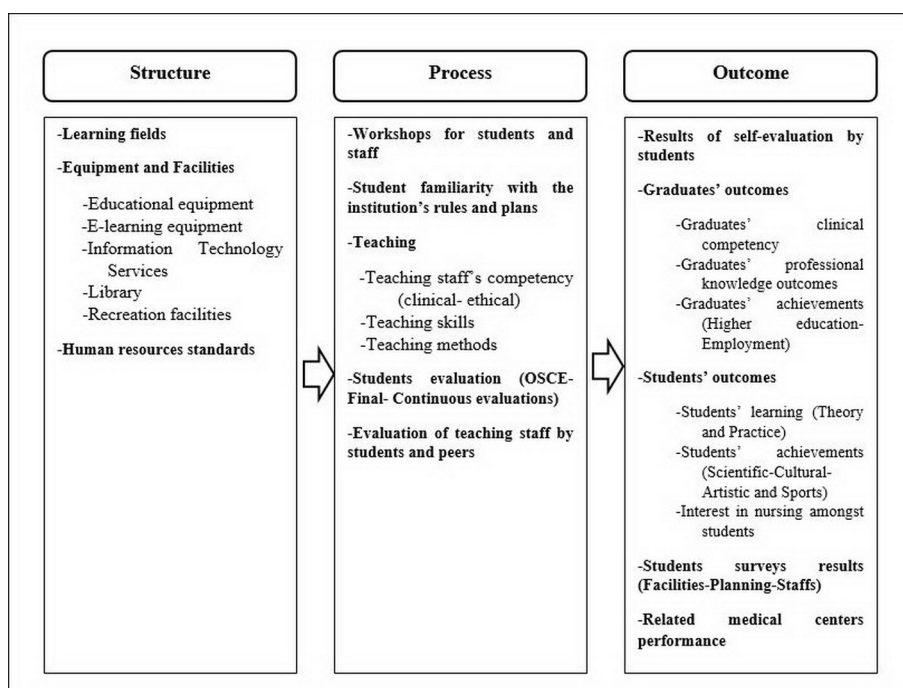


Figure 1 The Donabedian model components and related emerged categories. Categories that emerged during the data analysis process were compared and assigned to related component of the Donabedian model (structure–process–outcome). OSCE, Objective Structured Clinical Examination.

hospital for several consecutive semesters. They believed that this would decline learning different skills because the clinical cases and the care they observed or implemented were mostly the same.

For example, most of us were in the same groups from the first semester, we did not go to the departments like endocrinology, gastroenterology, ENT (Other participants: we did not go either, always internal medicine and surgical wards).

Equipment and facilities

This category consists of five subcategories (figure 1). Students will need both enough and suitable equipment to help them in achieving learning goals long with some other kind of facilities such as recreation facilities.

Students say that one of the problems they faced during their study period was the lack of different types of teaching aid equipment. They believed that the presence of a sufficient number of suitable and up-to-date equipment, such as books, moulages and computers is effective in improving their learning outcomes.

Those moulages were also a limitation because they said that their price is too high. (Educational equipment)

IT, most of the computers do not connect to the Internet. (Information Technology Services)

... I wanted a book; the latest version is 2020. The version in the library I think is 2008, books aren't up to date. (Library)

Students were also very dissatisfied with the quality of online classes, especially during the COVID-19 crisis.

A voice file had been uploaded, it couldn't be played, ..., online education is really weak, I really did not learn anything from the fifth semester (E-learning equipment)

They also stated that in addition to teaching and learning, other aspects of the school such as environments and recreational facilities are very important.

For example, if the space doesn't be too small, the space of the college itself, the rest environment be enough for students, it is important... (Recreation facilities)

Human resources standards

It is important to comply with the standards for human resources, these standards are set to guarantee the students receive the proper training. Participants stated that in clinical fields, when the number of students under the training of a clinical instructor increases, or when the number of students in the class is more than usual, the teacher's ability to convey knowledge and skills decreases.

... for example, in each clinical learning environment, there are seven or eight students with one instructor. The instructor can't manage them.

Process component

By defining process as all the acts of nursing education institutions, five categories were assigned to the process component (figure 1).

Workshops for students and staff

Besides learning goals and requirements specified in the curriculum, there is a need for extra training and education in the format of workshops with topics related to the nursing practice or any other skills that can help the students during the academic path or later in the labour market as a nurse or still later in life as a member of society.

Participants believed that improving their personal and professional skills requires additional training in the form of various workshops so that each person can participate in those workshops according to their learning needs in a specific field.

In addition to that academic and practical skills, I think that other workshops that are held, usually in colleges, which, for example, strengthen communication skills or self-confidence, are also very effective.

Students believed teaching staff may need specific continuing education and training to improve their skills in emerging teaching and nursing topics.

They offer online medical education courses for faculty members. This actually teaches them to be good teachers as well.

Student familiarity with the institution's rules and plans

Students' confusion about steps they must take or the process they have to continue solving a specific issue while pursuing their academic path may impose stress on students.

Participants stated that administrative processes and other processes related to students should be clearly defined and communicated to students.

Another issue is the administrative procedures of the college. For example, there is a problem for example in the planning of the internship groups; when we go to the department of education, he says it is not my job. when we go to another person he would say no in such and such meeting this decision has made, no one is in his place...

Teaching

The teaching category consists of three subcategories (figure 1). Teaching is considered one of the most important acts of nursing education institutions based on students' perspectives. These can be implemented by teachers and instructors properly only if the required tools and characteristics exist.

The students participating in this study emphasised that in addition to the scientific knowledge that a professor should have, clinical skills and experience in a field such

as nursing are very important. Also, the students especially expected ethical behaviour from the teachers. Ethical behaviour from the point of view of students includes appropriate and respectful behaviour with students.

...do they have the qualifications to teach a Bachelor's degree student who will work as a nurse? There must be some indicators that measure them in terms of professional competence in nursing, which is a practical and theoretical field together. {Teaching staffs' competency (clinical- ethical)}

Whatever the level of the teacher be good, in all aspects, both academically and ethically, everything ... I think it would be more useful {Teaching staffs' competency (clinical- ethical)}

The ability to transfer this knowledge and skills is also important.

It is not only the scientific knowledge, but it is also important that if they can present appropriately in a class, we had many professors who, for example, had a good scientific knowledge, but their expression was weak. (Teaching skills)

In addition to the characteristics and abilities of a person, a suitable method is also needed to be chosen so that teachers can teach different subjects appropriately.

some of the lessons must be taught practically not just by lecture (Teaching methods)

Students evaluation (OSCE–final–continuous evaluations)

Continuous and proper evaluation of the students is an important aspect of the educational process. It helps to understand what is working well and what needs improvement. The students agreed with their evaluation by the teachers, but they stated that the evaluation methods are sometimes not appropriate to the learning goals. Evaluation should be done continuously and there is still a need to develop standard and reliable objective structured clinical examination (OSCE) or final exit exam.

But if it is continuous, for example, make a general evaluation of the student every month, this can be effective.

I myself agree with this OSCE or the Final, I think it is very good because the student does not enter the clinical settings without enough information, but first of all, some changes and improvements are needed.

Evaluation of teaching staff by students and peers

Evaluating is an important step for improving teachers. Teachers are the pillars for education, knowing their strengths and weaknesses may help them move forward to better performance. Students, as the direct recipients of their services, are the proper means to do the evaluation.

The students stated that, although they complete the evaluation form of the teachers, their opinions in the final evaluations are not taken into account.

Another important thing is teachers' evaluation, here the evaluation that we do for teachers have no influence; it means that we may not have given a good rating to our teacher, but it had no effect, or they do not check the results at all (Evaluation of teaching staff by students and peers)

Also, because teachers are familiar with the nature and the requirements of the nurse education alongside their colleagues' performance, they can also help in evaluation. Students thought that there was a void for peer assessment in colleges.

For example, peer checking itself is very good. We never have peer checking for teachers (Evaluation of teaching staff by students and peers)

But these evaluations need to be done in a way that can overcome the inherent biases.

Outcome component

By defining outcome or results as all the effects of nursing education institutions, five categories were assigned to the outcome component categories (figure 1).

Results of self-evaluation by students

Each person, her/himself, can evaluate her/his progress better than anyone else. So providing a situation for a student to rate her/his learning may help us to understand if an institution has been successful or not. Students requested that it be possible for them to evaluate their progress at the end of each semester or in general.

There should also be a survey to see if, for example, you have seen an improvement in your skills after these semesters? (Results of self-evaluation by students)

For example, we can ask the students themselves; finally the student is more aware of her own situation (Results of self-evaluation by students)

Graduates' outcomes

Graduates' outcomes category consists of three subcategories (figure 1). This differs from self-evaluation because we here need to assess the objective outcomes achieved by graduates using proper measures. These outcomes can be related to knowledge, attitude or performance, in addition to all aspects of the institution, whether the main role is nursing education or other side activities like sport and art. Things such as higher education, being employed in nursing jobs or the quality of clinical performance of the graduates of an institution, according to the participants of this study, can represent the appropriate performance of that institution.

...the graduate follow-up I think is a good metric, including how many of our graduates are continuing higher educations, hiring, and how many are attracted to the clinical settings and how much they give up their job {Graduates' achievements (Higher education- Employment)}

... for example we were in a hospital, I had taken my friend (he was sick). The new nurse did not know what to do, how to use iv catheter properly. Well, this is another evaluation criterion (Graduates' clinical competency)

Students' outcomes

This category is similar to graduates' outcomes, but the achievements and learning outcomes expected from students differ from graduates.

One of the most important things mentioned by the students is the level of interest that will arise in students towards their field of study. The performance of instructors, professors, staff and in general all elements of the faculty can increase the student's interest in the field s/he chose to study or can even lead the student to drop out.

Even the level of interest of students in the field of study (Interest in nursing amongst students)

In addition to the main goal of the school, which is to achieve the learning goals set for the student in relation to nursing, it is important for the students that the school can provide the possibility of flourishing in other aspects of their interest, such as sports, art, etc.

Students' other activities, how much they do other things besides studying (other participants: Yes, in other words, such as research and cultural activities) {Students' achievements (Scientific-Cultural- Artistic and Sports)}

The ideal state of a college is that whatever it is, for example, you study nursing here, it should not be just nursing, it should be music, it should be art, these should be taught to some extent {Students' achievements (Scientific-Cultural- Artistic and Sports)}.

While perhaps the most important function of the school should be the students' learning. Students believe that even some initial learning goals have not been achieved even until the final semesters.

When we are in the seventh semester and this semester we just have learned how to give a medicine to a patient. We can infusion it with how much fluid in how many minutes. This is a big problem in my opinion {Students' learning (Theory and Practice)}.

Students surveys results (facilities–planning–staffs)

As one of the most important stakeholders in higher education, students can rate institutions in different aspects because they have been in close contact with these components. The students mentioned that unfortunately they were not given an opportunity to talk about their problems in relation to the school. There is no possibility, opportunity or means to express schools' defects.

...For example, we really wanted to talk about problems; for example, if I were myself, I would talk, ...

they never conducted a survey of students, we never saw.

Related medical centres performance

As a consequence of all the institution's and its outputs' and employments' functions, related medical centres performance may improve. The participants stated that by examining the performance of medical centres that are affiliated with the school in long-term periods, the impact of the performance of the school and its outputs in these centres can be investigated, which can actually be a representative of the performance of the school.

What to do about education in clinical settings. What changes have been made in these few years, for example? Certainly, in short periods of time, one year, two years, it is not possible to do this like accreditation, but for example, we can say in five years in a clinical setting, how was its start, and what achievements it has made in five years...

DISCUSSION

In this qualitative study, we aimed to specify important domains of a nursing education institution that need to be measured to represent its performance via students' perspectives, one of the most important stakeholders in higher education. In this section, we bring our findings related to structure, process and outcome and discuss them based on findings of other studies.

Findings of our study indicate that 'learning fields', 'equipment and facilities' and 'human resources standards' are among those factors that shape important aspects of a nursing school structure. In a study that aimed to find factors that form quality in higher education from student perspectives, 'facilities' and 'support staff quality' were among the factors mentioned by students.²⁷ In another study, some of the factors that significantly influence the quality of higher education were: 'quality of the study materials', 'friendly administrative staff' and 'equipment and infrastructure relevant to the needs of the study process'.¹³ Dube and Mlotshwa's study results also showed that classroom computer technological gadgets, internet connection and adequate learning facilities were perceived as fostering better academic performance of students.²⁸

Findings of these studies along with our study show that equipment, facilities and administrative staff are important for students and need to be measured. But in our study, the insist was on the number of the staff, while in two other studies mostly their behaviour were important. In another study, high volume of students in the clinical learning area was positively associated with the achievement of clinical learning outcomes,²⁹ which is opposite to our study findings. Students in our study believed that the more students in the clinical area the harder for the instructor to manage. The 'learning fields'

is also reported in our study findings as an important aspect to be measured. A study by Karabulut *et al* found that nursing students' academic motivation increased as the quality of their clinical learning environment improved,³⁰ while in this study, quality of learning fields is important, in our study, participants demand to experience different type of learning fields.

In the process component of our findings, 'teaching' category were similar to finding of Abbas's and Degtjarjova's studies. Abbas's study reports teaching quality (teachers' subject knowledge, communication/pastoral skills, syllabus/curriculum quality, teaching style and dealing/behaviour with students)²⁷ and Degtjarjova *et al*'s study reports 'teachers' competence' and 'teaching methods'.¹³ It is clear that in all three studies, the quality of teaching, teaching methods and teachers' competence were important for the participating students. How teachers treat or deal with students also got attention in these studies. Furthermore in Parvan *et al*'s study teaching behaviour reported important for learning by the students.³¹ Dube and Mlotshwa's study results showed that good and supportive relationships between nurse educators and students were perceived as fostering better academic performance of students.²⁸ Another finding of our study was 'workshops for students and staff', which is similar to extracurricular activities (counselling and personal development) in the Abbas's study.²⁷ Participants in our study stated there is a need for workshops besides usual learning goals to improve their personal and professional skills.

Student in our study also considered 'students evaluation (OSCE-final-continuous evaluations)' as a factor that need to be measured. In our study, students believed that the examinations held by the school are part of its performance. In a study by Andersson *et al*, the nursing students considered the national clinical final examination as an important means of quality assurance.³² The findings of Müller *et al*'s study also suggest that students consider the OSCE to be a valuable tool. Students believed that the OSCE may have an impact on the educational process and support the development of skills and behaviours required for clinical practice.³³ Holmes found that students thought they improved their learning, particularly their understanding, as a result of the continuous assessment.³⁴ Delaram *et al*'s study showed that weekly quiz tests increased the test scores in the mid-term and final examinations in the students.³⁵ All of these studies, along with our study, consider students evaluation important. But in the opposite, in Al Ahmad *et al*'s study, many students do not see any benefit for the exit exam.³⁶

Wang *et al* based on their finding recommend that students should play multiple roles as participants, consumers and evaluators in higher education quality assessment. They also advise considering the perspective of students as an important element of quality evaluation, enhancement, assurance and control at the institutional level.³⁷ Our participants believe students should be evaluators, too, to evaluate teachers, themselves and

even schools (students surveys). The findings of Ulker's study demonstrate that student evaluations can lead to the improvement of teaching quality.³⁸ In another study, findings revealed the need elements of self-assessment in relation to examination to make the students more aware of their clinical competence.³⁹

Based on our study findings, besides students' self-evaluation and surveys results, students' and graduates' outcomes and related medical centres' performance are among nursing education institutions' outcomes that should be considered. In a study, employability links (links with employers and employability training,²⁷ and in Degtjarjova *et al* study clear achievement assessment and feedback, higher education future prospects; graduates' competitiveness in the labour market,¹³ were among the quality factors. The results of these studies are almost compatible with ours. In our study, higher education, employment, learning and competence of graduates/students were important for participants too.

Measuring related medical centres' performance as an indicator of the performance of the school can be a new finding that has not been discussed in the studies. One of the reasons that can cause this matter to get less attention is that this is a problem specific to disciplines with clinical practice like nursing. Furthermore measuring this dimension can be very difficult and requires careful planning. We also could not find a study that reports about student familiarity with the institution's rules and plans.

The findings of our study were expressed from the perspective of students, one of the most important stakeholders of higher education. Educational leaders can consider these results in planning for the design of performance measurement systems that are carried out in order to improve the performance of educational institutions. Many simple but important aspects from the perspective of students have been neglected in measuring the performance of educational institutions such as self-evaluation by students or peer evaluation for teachers. Nursing educators can also evaluate the dimensions that are mentioned in this study and are in the scope of their performance with appropriate tools and improve it if needed. Researchers may provide a more comprehensive view of the issue by examining the opinions of other stakeholders that are less addressed, such as nurses or families, and integrate and compare the findings of these studies with our findings and other studies.

The limitation in this study was that because our data collection method was focus group and students were invited to join the sessions voluntarily, so characteristics of those who accepted to participate may be different from others. The truth is that those who tend to speak in front of a group of people can have different personality traits than people who do not like to talk in groups. But considering that we are not investigating any personality traits in people, this type of sampling used in our study cannot cause bias in the samples and thus threaten the rigour of data collected.

CONCLUSION

Important aspects of nursing education institution performance that need to be measured in the students' perspective were determined in this context. Stakeholders' consultation can be considered as one of the very first steps in developing a measurement system with the aim of improvement. Based on the needs and ideas of this important group of stakeholders, we can proceed further. Still more investigation among other groups of stakeholders and understanding their point of view is also essential. When specified what is important to be measured, it is appropriate to develop or choose suitable and measurable performance indicators for each of the recognised categories so it will make a management dashboard for responsible parties to determine issues and weak points, plan and take required actions.

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