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Translation and Validation of the Clinical Learning Environment and Nurse Teacher Scale (CLES+T) in Persian Language

Roshanak Kakvan

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***“Translation and Validation of the Clinical
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(CLES+T) in Persian Language”***

Doctorand: Roshanak Kakvan

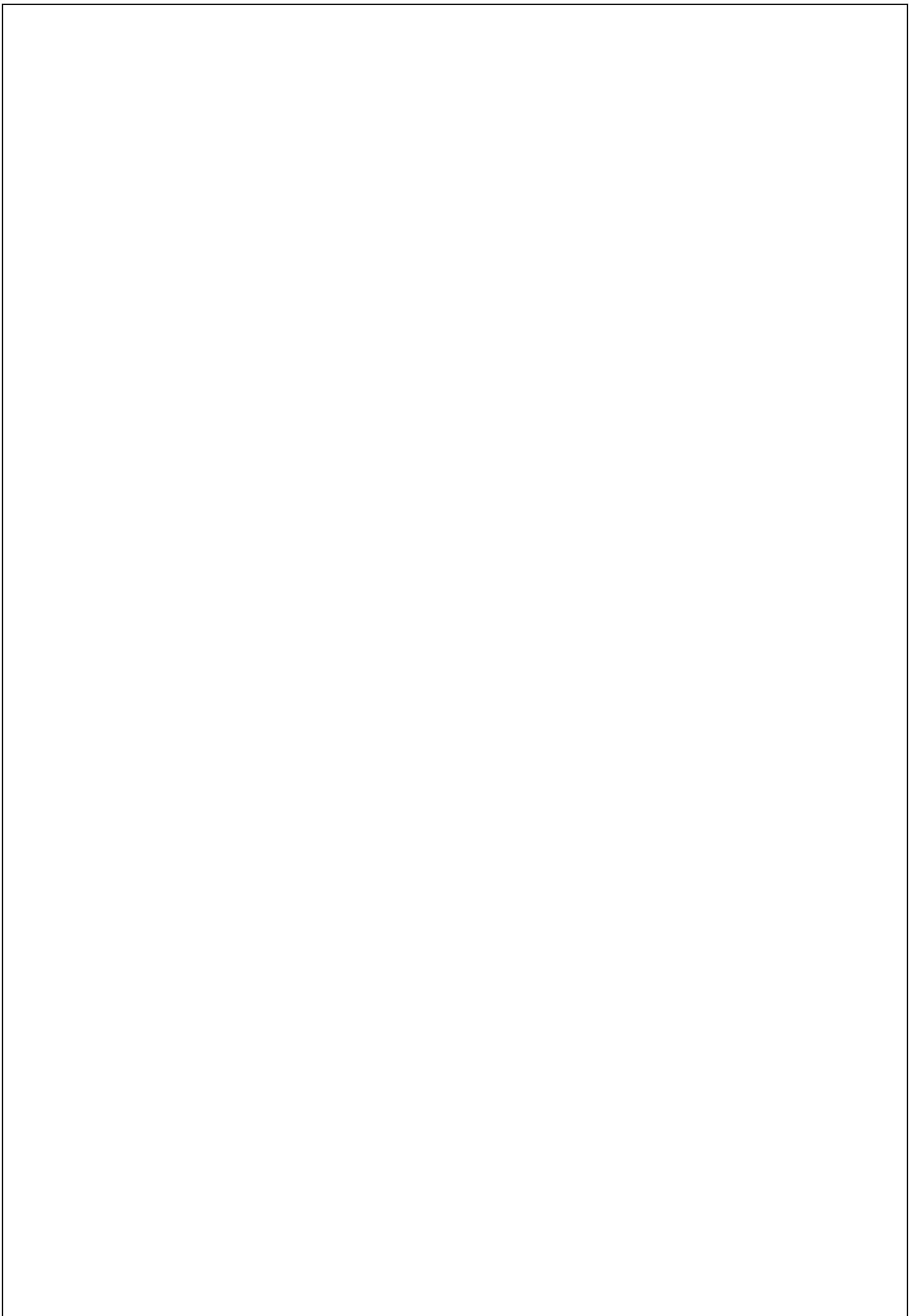
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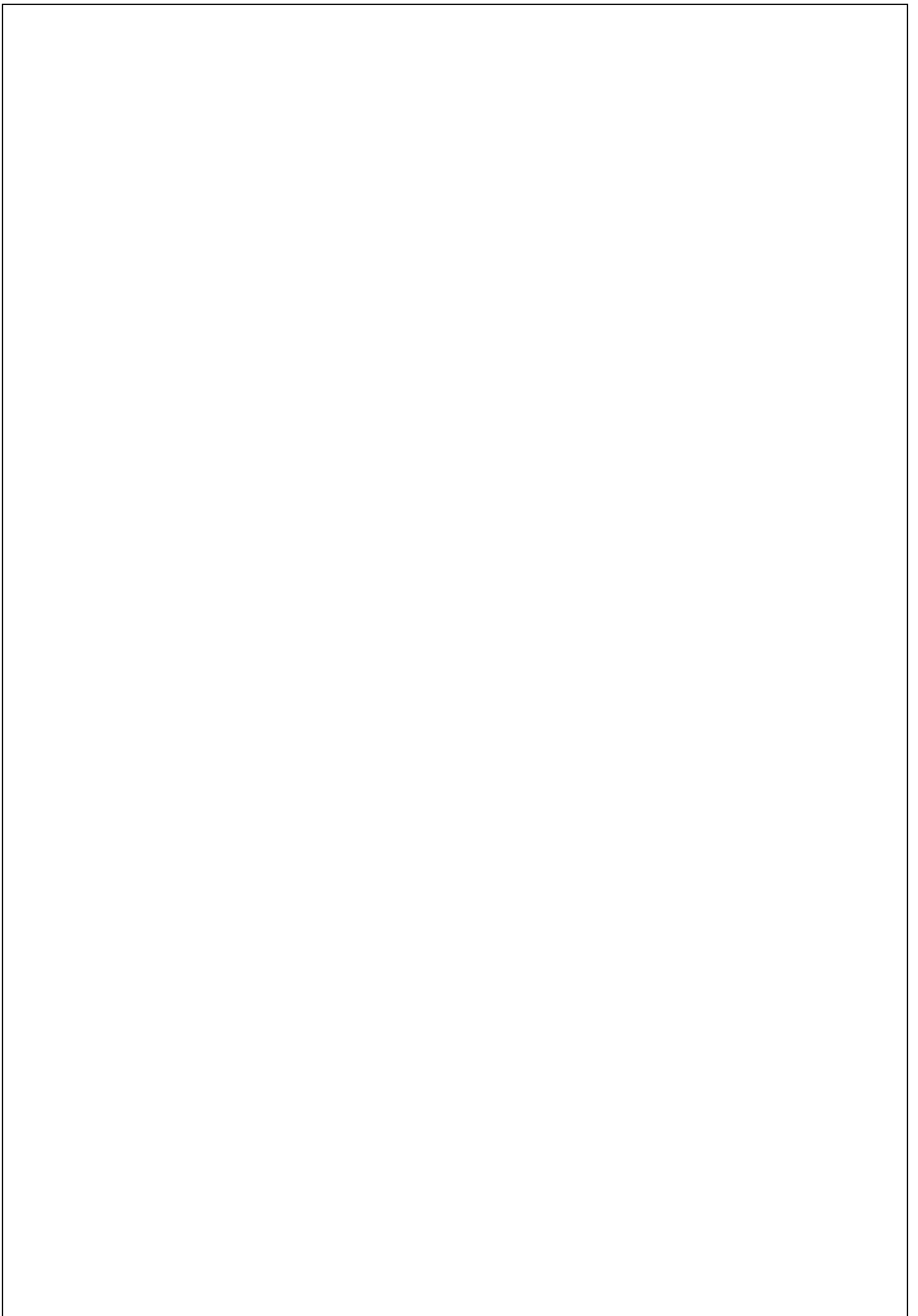
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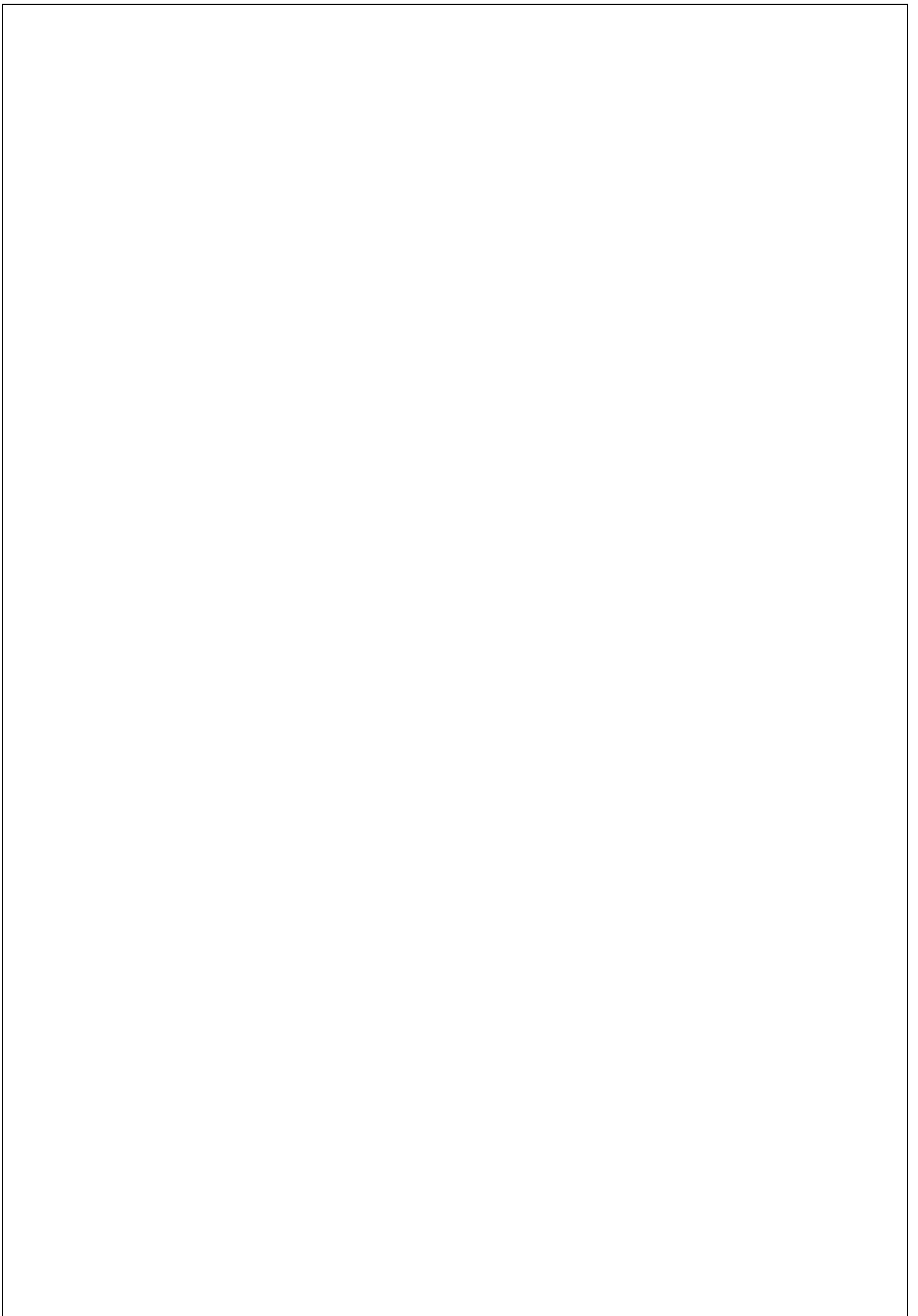
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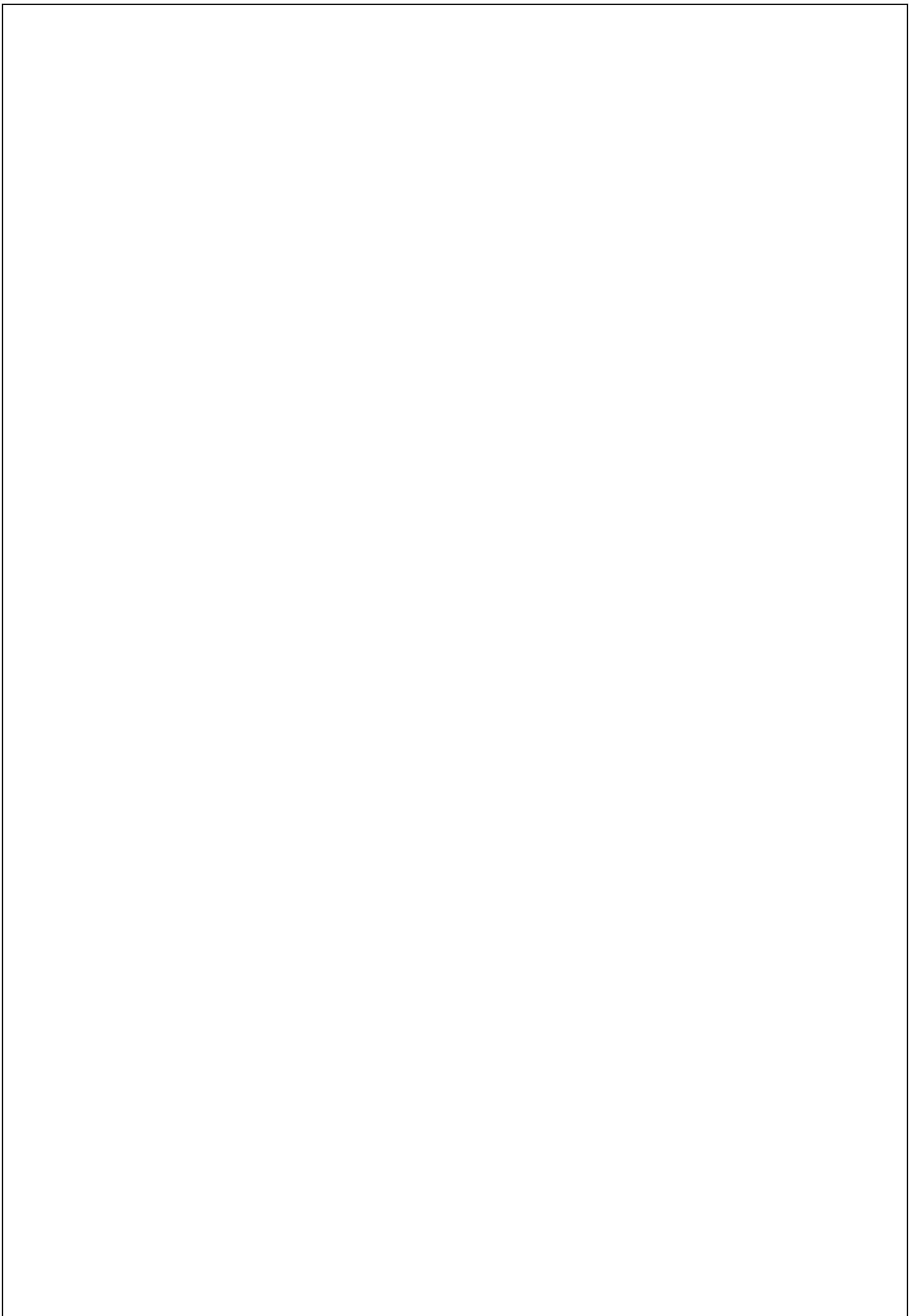
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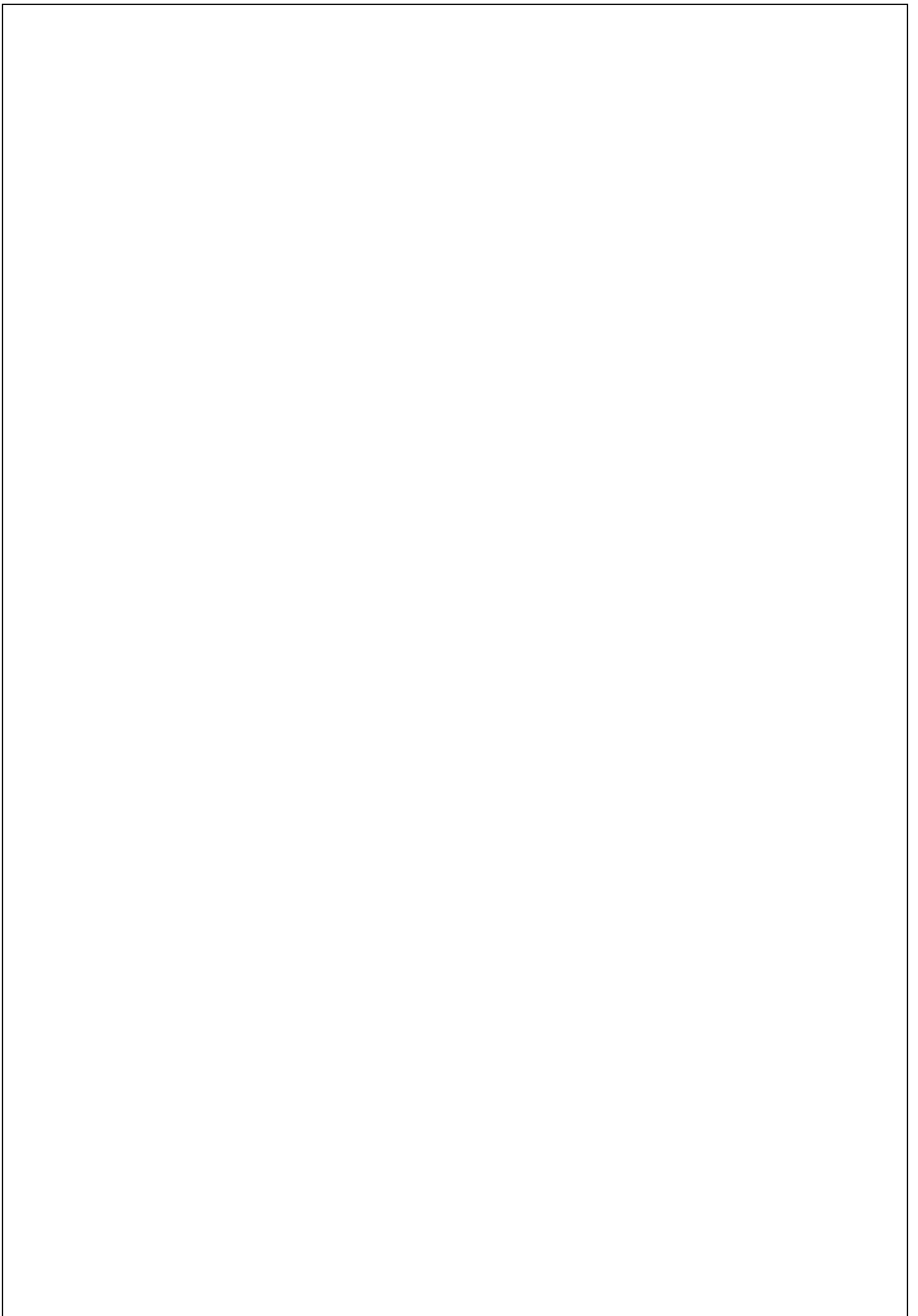
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Abstract



Nursing is considered a profession with reliable knowledge and practical skills. Nursing education is a combination of two complementary parts: a theoretical part and clinical practice.

Clinical practice provides up to half of the educational experience for students undertaking registration nurse education programs. Clinical learning objectives are affected by a large number of factors, including individual attitudes, experience and characteristics, psychomotor skills, problem-solving ability and knowledge of the student, physical structure of the environment, educational content, and methodology. All these factors occur within a complex and dynamic learning environment known as the clinical environment. Recently, a great deal of attention has been given to the clinical learning environment to emphasize the importance of multi-dimensional placement for students' learning.

The aims of this study are: to investigate the Clinical learning environment, supervision, and nurse teacher (CLES+T) scale in 10 countries all around the world; to describe the process of translation, cultural adaptation and to validate the CLES+T questionnaire in Persian language.

Methods: in general The Clinical Learning Environment and Supervision, Nurse Teacher (CLES+T) Evaluation Scale was used in this study. CLES+T consist of 34 items defined in 5 dimensions that were identified in the psychometric testing: pedagogical atmosphere (9 items) supervisory relationship (8 items), premises of nursing in the ward (4 items), leadership style of the ward (4 items) and the role of nurse teachers (9 items). Each CLES+T items evaluates on five-Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Results: The review study includes 7 cross-sectional studies, five studies were carried out in Europe and two studies were in Asia, it was carried out by systematic review and meta-analysis (PRISMA).

The other objective consists of a cross sectional study carried out in 2018-2019 in four universities in Iran, descriptive statistics such as demographic and characteristics of data showed by excel, The reliability of the instrument was estimated with Cronbach's alpha coefficient that examine the internal consistency of the Persian version of the instrument and each sub-dimension. The construct

validity of CLES+T scale was assessed by Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). In overall the actions, which were used in this confirmation of validity and reliability, were:

- (1) The evaluations of results of pilot study.
- (2) The use of an expert panel.
- (3) Test-retest with a small sample.
- (4) Content validity, face validity, concurrent validity, construct validity and internal consistency reliability were measured and confirmed.

There are no significant differences in the mean value related to different topographical territories and different educational system. The result of this study indicate that the Persian version of the CLES+T instrument showed acceptable psychometric properties for evaluating student nurses clinical placement the adapted CLES+T scale when used among nursing student in Iran, was understandable, useful, and had high internal consistency and reliability so the CLES+T can be considered to be promising tool for the evaluation the learning environment for nursing student.

Discussion: The CLES+T is a valuable tool to evaluate practical part of nursing studies and to identify key factors in clinical learning environment of student nurses in different countries from distinct geographical areas. The most important factors of the Iranian version of CLES+T are the role of nurse teacher and the pedagogical aspects.

Resumen

La educación en enfermería es una combinación de dos dimensiones complementarias: una teórica y una práctica. La enfermería es una profesión con un corpus de conocimientos propios donde las habilidades prácticas son muy importantes.

La práctica clínica proporciona a los estudiantes de enfermería la mitad de la experiencia educativa. Los objetivos de aprendizaje clínico se ven afectados por diferentes factores como las actitudes, la experiencia, las habilidades

psicomotoras, la capacidad de resolución de problemas y el conocimiento del alumno. Asimismo, la estructura física del entorno, el contenido educativo y la metodología son factores a tener en cuenta; ya que son factores que ocurren dentro del entorno del aprendizaje clínico.

Los objetivos de esta tesis son: describir el entorno de aprendizaje clínico, la supervisión y la escala del profesor de enfermería (CLES+ T) en 10 países de todo el mundo; describir el proceso de traducción, adaptación cultural y validar el cuestionario CLES+T en lengua persa.

En este estudio se utilizó la Escala de Evaluación de Entorno y Supervisión Clínica de Aprendizaje, Enfermera Docente (CLES+T). CLES+T consta de 34 ítems definidos en 5 dimensiones: ambiente pedagógico (9 ítems) relación de supervisión (8 ítems), premisas de enfermería en la sala (4 ítems), estilo de liderazgo (4 ítems) ítems) y el papel de los profesores de enfermería (9 ítems). Cada ítem de CLES + T se evalúa en una escala de Likert que va de 1 (muy en desacuerdo) a 5 (muy de acuerdo).

Resultados: revisión sistemática mediante el modelo PRISMA. Estudio transversal realizado en 2018-2019 en cuatro universidades de Irán. En general, las acciones que se utilizaron en esta confirmación de validez y confiabilidad fueron:

- 1) Las evaluaciones de resultados del estudio piloto.
- (2) El uso de un panel de expertos.
- (3) Prueba-reprueba con una pequeña muestra.
- (4) Medición y confirmación de la validez de contenido, la validez aparente, la validez concurrente, la validez de constructo y la fiabilidad de la consistencia interna.

No existen diferencias significativas en el valor medio relacionado con diferentes territorios topográficos y diferentes sistemas educativos. El resultado de este estudio indica que la versión persa del instrumento CLES+T mostró propiedades psicométricas aceptables para evaluar la ubicación clínica de los estudiantes de enfermería, la escala CLES+T adaptada cuando se usó entre estudiantes de

enfermería en Irán, fue comprensible, útil y tuvo una alta consistencia interna y confiabilidad para que el CLES+T pueda considerarse una herramienta prometedora para la evaluación del ambiente de aprendizaje del estudiante de enfermería.

Discusión: El instrumento CLES + T es una valiosa herramienta para evaluar la parte práctica de los estudios de enfermería e identificar factores clave en el entorno del aprendizaje clínico de los estudiantes de enfermería en diferentes países. Los factores más importantes de la versión iraní de CLES + T son el papel del profesor de enfermería y los aspectos pedagógicos.

1 Introduction

The healthcare environment in this rapidly changing world society is emphasizing the boost of preventive and customized healthcare, and an improved communication and emotional connection between patients and healthcare providers is becoming increasingly important. In response to these recent changes, it is important to expand the general services to provide high quality medical care to patients and build a safe healthcare environment (Lee, 2017).

Nurses' work is specialized and advanced in accordance with the changing healthcare environments, and independent nursing activities need to expand. Nursing is a profession-based discipline and adequate training has an important role in developing nursing skills, today's nursing students are the nurses of tomorrow. Nurses focus on the person across multiple settings, such as ambulatory, hospital, and home care, and also in community and public health settings (Beom, 2014).

Nursing faculties play an essential role in creating learning environments that develop the positive configuration of future nurses (Yazdannik et al., 2017). Preparing those who are involved in taking care of patients is one of the most important issues in any healthcare system all over the world. Among the expert workers, nurses are at the forefront in providing health care to patients in hospitals and furthermore, they must approach numerous challenges which face the community such as home, school, factories and healthcare institutions. These factors explain the importance of having a high standard nursing education (Amini et al., 2016). An organized education for nurses began about a hundred and fifty years ago. For about the first hundred years, most of this education took place in hospital-based and hospital-owned schools. However the nursing occupation has a wealthy and long history. Today the history of nursing matters more than the issues of healthcare policy and practice (Wierzbicka, 2019).

The nature of this profession is keeping human lives safe and helping other human beings. This profession requires continuous and close contact with other people and its practitioners must have the ability to help others. Today, the profession is growing rapidly and the persistent researches that have been carried out in this field have successfully contributed to achieve a high level of professionalism. After obtaining the required qualifications from the nursing

university, nurses are able to practise their profession (Hongbao et al., 2015). The first pioneer of modern nursing was Florence Nightingale who was born in Florence, Italy, in 1820, in an English family. At the age of 30, against her parents' wishes, Nightingale entered the nurses' training program in Kaisers Werth, Germany, where she spent 3 years learning the basics of nursing under the guidance of the Protestant deaconesses (McDonald, 2010). During the Crimean war of 1854, in Turkey, she tried to provide patients with basic facilities. Nightingale set about the task of organizing and cleaning the hospital and providing care to the wounded soldiers. She tried to provide the patient healthy foods as fruit. By these very simple measures, the mortality rate decreased from 60% to 42% and then to 2.2% (Thaise Frello & Carraro, 2013). Following the Crimean War, in 1860, she established the Nightingale nursing school at St. Thomas Hospital in London which was the first nursing school in the world. With the establishment of this school, she turned nursing into a well-regarded profession (Karimi & Masoudi, 2015). She proclaimed nursing her occupation and this led to great changes in nursing which became a universal profession. Her point of view and theory represented a huge step forward in the development of nursing and consequently, nurses focused on the environment and its effects on human health. Both the nursing role and education were defined for the first time by Florence Nightingale (Wierzbicka, 2019).

The establishment of the International Council of Nurses (ICN) in 1899 was an important event that influenced the further expansion of nursing not only in Europe but also worldwide. The ICN started as a small organization in the wide setting of the women's movement. The ICN has sustained its place as an important and meaningful organization for nurses from around the world. The ICN aimed to ensure that standard nursing care was available to everybody by improving nursing knowledge, by uniting nurses internationally, contributing to health policies globally, and ensuring the presence of a respected, competent, and satisfied nursing workforce everywhere (Catton, 2019). The main purpose of creating the ICN was to develop a professional nursing personnel around the world by enabling nurses from different countries to communicate with each other (Hongbao et al., 2015). In 1901, the ICN held its first meeting in Buffalo, New York. The purpose of this meeting was to formalize the moral principle that

“inherent in nursing is the respect for human rights, including cultural rights, the right to life and choice, to dignity and to be treated with respect. Nursing care is respectful of and unrestricted by considerations of age, color, creed, culture, disability or illness, gender, sexual orientation, nationality, politics, race, or social status” (Bartz, 2010).

In addition, the ICN describes nursing as follows:

- Nursing includes independent and collaborative care of individuals of all ages, groups, families, and communities, sick or healthy and in all settings.
- Nursing encompasses the development of health, prevention of sickness, and the care of unhealthy, disabled, and dying people.
- Development of a safe environment, research, involvement in health policy and health systems management and education are also crucial nursing roles (Burton, 2019). In the early 19th century, hospital based training developed with a special recognition to the practical experience. The Nightingale-style school began to vanish and hospitals considered nursing women as a source of cheap - even free- labor force. As a result, exploiting nurses became a common practice among employers and physicians (Carvalho, 2012). In the late 19th century, as nursing schools gained importance and recognition, many student associations of nursing schools started establishing and setting up private duty registries. It was at this time that Brow’s theory about nursing education led to the implementation of two levels of education, professional nursing and practical nursing that has contributed to the evolution from hospital-based nursing education to higher learning institutions (Morin, 2014).

During the first and second world wars, the nursing profession improved significantly and underwent a dramatic transformation. The first standardized curriculum of nursing education was introduced in 1917. The two-year curriculum intended to train and prepare for professional nursing semi-professional nurses who could provide safe patient care but didn't have the ability of baccalaureate-level nurses (Leidel et al., 2020).

Historically, and until the recent past, there was no place for nursing schools and nursing schools didn't exist within the European higher education network. Nurses were trained at a professional level under the control of physicians. This kind of training in basic skills and knowledge was not sufficient for the independent role to be played by nurses when fulfilling their profession (Van der Wende, 2000). In the early 20th century nursing as a profession was still facing a lot of issues and many untrained women were working as nurses all around the world. Later in the century, nursing evolved toward a scientific, research-based, defined body of knowledge and practice. During the 20th century, nurses made significant progress in the areas of education, practice, research and technology. Nursing as a science progressed through education, clinical practice, development of theory, and rigorous research (Humar & Sansoni, 2017).

The Bologna Declaration in 1999 set the course for undergraduate and graduate education in Europe; it was named after the city in which the Conference on "The European Higher Education Area" took place. In June 1999, the Ministers of Education of some thirty European countries signed the "Bologna Declaration". Its aim was to set up the European area of higher education and to develop the European system of higher education in the world. It offers a system of easily readable and comparable degrees and the elimination of all remaining obstacles to free mobility (Van der Wende, 2000). Its objectives briefly include the following:

- Adoption of the European system of higher education.
- Establishment of an adequate level of qualification in higher education for three and four years.
- Establishment of a system for easy transfer and student mobility in European countries for higher education.
- Availability of all services related to education to students.
- Advancement of criteria and methodologies for quality evaluation.
- Cooperation between European dimensions of higher education (Aroral & Gulia, 2018)

The Bologna process has had an immense impact on nursing education in Europe. Nursing care requires analytical, research-based thinking. The Bologna Process created a great opportunity for nursing education at the Bachelor's level

and after its adoption, the majority of European countries' initial nursing education was advanced to attain a university level. Findings of an observational study in nine European countries have shown that hospitals with more nurses with a Bachelor's degree had significantly lower mortality rates than hospitals with fewer nurses with the same degree. Encouraging recruitment of a higher number of baccalaureate-level nurses and investing in higher education for nursing were the conclusions drawn in that study (Humar & Sansoni, 2017).

In the 21st century, the speed of change in health care is incredible as it is in all areas of the economic, social and business domain nowadays. In the last century, most of the nursing activity was related to “doing for” others. Many nurses worked with the sick or deprived. Much of the caring activity was focused on late-stage patients in fixing their problems and helping them to get back to normal life (Leidel et al., 2020). For instance, the whole foundation of healthcare has undergone a dramatic transformation. With the improvement of technology, the quality of life also increased. We are, in short, incapable of stopping or preventing the “early engagement with health services” that have a different base. Now the challenges faced by the nursing practice are related more to taking on the activities of informing, guiding, managing, teaching and advising. This kind of nursing practice requires a different learning and practice approach in an educational nursing system (Porter-O'Grady, 2001).

Nursing includes independent and collaborative care of persons of all ages, groups, families, and communities, either ill or healthy and in any settings. Nursing encompasses the prevention of illness, promotion of health, and the care of patients, disabled and dying people, improvement of a safe environment, investigation, participation in health policy and health system's organization and education (Barron & West, 2015).

Graduated nurses can work in a wide range of positions, including but not limited to professional health settings, physicians' offices, care facility companies as well as hospitals, visiting people in their homes and caring for them in schools, and research in pharmaceutical companies. Nurses work as researchers in laboratories, universities and research institutions (Morin, 2014). Most people

think the best way to learn these concepts is through experience, consistency and by following patterns of practice (Buerhaus, 2008).

While there are many ways in which countries prepare their nursing staff, all are committed to provide a workforce with good clinical practice to care for patients with complex problems. To that end, the National Institute of Medicine and Department of Human Resources for Health (WHO) now recognizes the need to increase the education level of nurses (Wierzbicka, 2019). All nurses must have a baccalaureate degree. The basic length of time to obtain a baccalaureate degree is four years to prepare nurses for a graduate-level education. For the first two years, students usually achieve general education requirements and spend the remaining time in nursing courses (Morrell & Ball, 2020).

Nursing universities now provide practicing nurses with more autonomy, and their function continues to extend beyond the care of sick people and includes health promotion and administrative and teaching activities. Hence, they play a larger role in the life of students and in promoting a healthy campus community. The importance of nursing education is in its focus on nursing practice and, as a result, it creates a powerful cultural climate in which both education and practice are emphasized (Joolae et al., 2015).

Nursing education faces two major challenges: 1) the inability of nursing programs to produce a sufficient number of nurses to meet the needs because of an insufficient staff, insufficient clinical sites, or other insufficient resources, and 2) the need to transform the nursing education in order to meet the complex healthcare needs of the nations in the future. To achieve this purpose, schools should recruit multicultural students, the number of advance practice nurses should be increased, curricula and learning activities should develop students' critical thinking and continuing faculty development activities should be promoted to support excellence in practice, teaching and research (Fang et al., 2006).

Due to the growth of multicultural societies and the increased interest in nurses' migration, the nursing degrees in one country may be invalid in another country. The responsible organizations should develop common standards and qualifications among countries and the university curricula should have an

international standard character. It is very likely that nursing services will be improved, and nurses will achieve an internationally valid certificate (Aroral & Gulia, 2018).

Some determining factors for the migration of nurses from developing to developed countries are: differences of salary, insufficient job opportunities, limited growth in education, unsuitable working conditions, lack of resources, and a tendency to more professional advancement opportunities. Nurses constitute the largest and most internationalized section of health professions globally. As a result, there are some strategies to develop nursing education in a setting where the social status and working conditions of nurses are highly variable (Ohman et al., 2016).

The aim of nursing education is to enhance the students' capacity to ensure they are well-prepared to supply safe and quality patient care. Nursing education is divided into academic lectures and clinical practice, both being great challenges in the nursing programs (Nepal et al., 2016). The real learning of nursing students takes place in the practical training and students learn how to manage their time and readiness for clinical experiences and how to complete professional steps from dependence to independence. As a result, the learning methods of nursing students are among the most important concerns of the educational authorities (Sharif et al., 2005). Clinical learning objectives include the ability of nursing students to develop clinical competencies and socialization in the nursing profession which are affected by a large number of factors, including individual attitude, experience and characteristics, psychomotor skills, problem-solving ability and knowledge of the student, physical structure of the environment, educational content, and method. All of these factors occur within a complex and dynamic learning environment called the clinical environment (Anderson et al., 2014).

Negative and positive clinical experiences have additional effects on the students' motivation and learning in clinical settings. It is the students' right to have meaningful and appropriate clinical learning opportunities. In recent decades, the clinical learning environment has increasingly received attention and an emphasis has been put on the important multidimensional placement for

students' learning. Clinical learning occurs in a place where patients receive assistance, a place where the staff work and students learn, so it contains physical, psychosocial, and organizational factors (Ranjbar, 2015). According to Dunn and Burnett's definition "the clinical learning can be defined as an interactive network of forces within the clinical setting that influence the students' learning outcomes" (Dunn & Burnett, 1995).

Nursing faculties play an essential role in setting up learning environments that develop the positive establishment of future nurses. The nursing faculty is the early source of learning professional attitudes and culture to which students desire to belong. The students' foundation of a nursing identity is constructed in social interactions with the educators and the nursing faculty, and shaped by norms learned by both the formal and informal curriculum. Understanding how academic learning is implicated in the shaping of nursing identity and the professional aspirations and socialization of nursing students is effective because it can conduct strategies that promote nursing professionalism (Yazdannik et al., 2017).

At least half of the nursing education time is focused on the clinical learning, it is a critical part of the nursing curriculum, and both the clinical qualification and professional personality of the future nurses are formed in this period. Many factors have significant influence on the clinical learning, which may be related to the faculty management, teacher, or the environment. Stress is one of the crucial and frequently reported factors that may influence students' learning, especially in clinical settings. There is a significant number of reports on main stressing factors in clinical nursing education, such as student assessments, instructor's teaching skills, non-cooperating staff, inappropriate communication between instructors and students (Changiz et al., 2012).

The clinical practice has been historically identified as one of the main causes of anxiety in the nursing program because this environment prepares student nurses to transfer "knowing" to "doing" through their thinking. Factors such as the unfamiliarity with the area, the lack of experience, fear of making mistakes, fear of patients or technology-related error as well as being assessed by supervisors make the situation more stressful for the students (Chupai, 2016). This kind of

stress reduces the students' motivation and self-esteem and as a result, students may not accept themselves as nursing students, they lose interest in their profession and are no longer proud of being nurses (Yousefi et al., 2015).

The clinical learning environment is an interactive network of social factors that have an effect on students and their learning outcome. Therefore, it is difficult to plan an optimal clinical learning environment (Anderson et al., 2014). An effective learning environment improves the students' satisfaction, motivation, and self-efficacy. Students' satisfaction during clinical placement is directly related to the supervisor's supportive behavior and feeling welcome during the clinical placement, as well as to the nursing staff's attitudes (Claeys et al., 2015). Furthermore, multiple factors influence the students' motivation to become nurses. Factors such as the quality of learning, the support from the university, the learning process and the learning environment facilities influence their motivation intrinsically and extrinsically. Self-efficacy occurs when students are encouraged to take more active roles in clinical placement and are included as a part of the team and participate in discussions (Bos et al., 2015).

The clinical learning environment includes four aspects: (1) physical appearance, (2) psychosocial and interaction factors, (3) cultural factors, (4) teaching and learning elements. When all four aspects are achieved satisfactorily, graduates are prepared to enter the professional practice. Clinical learning environment must be evaluated as a negative or a positive environment to promote learning and prepare students to learn how to apply nursing knowledge, nursing skills, patient communication and professionalization, as well as prepare them for their future workplace (Flott & Linden., 2015).

There are international differences between the nursing programs. For instance, there are some programs that run for three years or four years. Not all clinical learning environments are equally suitable for promoting student nurses' competencies in their clinical practice. Therefore, valid tools require to assess the quality of clinical placement (Mansutti et al., 2017).

A positive clinical learning environment increases learning outcomes as well as skill and knowledge acquisition whereas a negative clinical learning environment

affects the learning process and the students' satisfaction and self-esteem. The lack of opportunities to take responsibility in clinical placement results in nursing graduates not being sufficiently prepared for work organization (Bigdeli et al., 2015).

The clinical learning environment includes everything that surrounds student nurses like the clinical setting which is among the internal factors; and the patients, the student's peers, the clinical supervisor, the nursing teacher as well as the leadership style which are among the external factors. The clinical environment consists of the hospital, the inpatients and outpatients, the primary healthcare and the community settings which have their specific challenges and actual learning environment. Depending on the placement characteristics, students achieve different skills and attitudes (Claeys et al., 2015).

Clinical learning environments are multidimensional organisms in which many factors are connected and interact with each other to determine the nursing students' learning experiences (Henriksen et al., 2012). The literature on learning environments for nursing students in clinical placement identifies various dimensions that affect nursing students while they pass clinical practice, such as: (1) pedagogical atmosphere (2) supervisory relationship, (3) premises of nursing care on the ward (4) management leadership style and (5) the role of the nurse educator (Doyle et al., 2017). We are going to concisely explain these five dimensions below:

Pedagogical atmosphere

Throughout nursing education, practice exists independently from theory. The educational, cultural, and fundamental part of learning which deals with relationship, trust, and community in a clinical atmosphere is called pedagogical atmosphere. A successful learning environment is created through an inspirational pedagogical atmosphere, which means a positive atmosphere to interact with ward staff, ask questions, and achieve a meaningful learning situation (Jusso & Liene, 2005).

The most important factor in the assessment of the pedagogical atmosphere on the ward is to determine if student nurses have a good communication with the staff members in the unit, and whether they can make conversation easily with them in a positive atmosphere and whether they have an opportunity to take part in discussions during staff meetings. The overall assessment of the pedagogical atmosphere on the ward directly correlates with the duration of the practical placement (Riklikiene & Nalivaikiene, 2013).

Supervisory relationship

While much has been written and discussed on clinical supervision in the nursing literature, it appears that little attention has been paid to the supervisory relationship and in particular the early phases of this relationship. It is understood that the quality of the supervisory relationship has a significant contribution to the impression of clinical supervision (Saarikoski & Leino Kilpi, 2002). The functions of the supervisory relationship range from establishing clinical supervision, mentorship, and preceptorship that have a positive attitude towards supervision and positive interaction with the nursing students to improve the students' learning in nursing education (Tomietto et al., 2016).

Nurses have recognized the importance of supervisory relationship as a lower management tool in the hierarchical roles in ensuring timekeeping, regulating rates of work and monitoring the quality of work according to standards, as well as assessing the students in the practical part of their learning process and motivating the students as future workers. Nurses at all levels, from senior nursing staff to students, need to have a positive relationship with supervisors (Sundler et al., 2014).

In the UK, the term "clinical supervision" refers to activities that promote the clinical practices, knowledge and skills of the nursing team:

"Clinical supervision is a process based on a clinically-focused professional relationship between the practitioner engaged in clinical practice and a clinical supervisor. It complements, but does not take the place of formal programs of

education at pre and post-registration level. This relationship involves the clinical supervisor applying clinical knowledge and experience to assist colleagues to develop their practice, knowledge, and values. This relationship will, therefore, enable practitioners to establish, maintain, and improve clinical standards and promote innovation in clinical practice." (UKCC, 1995)

The organization of the supervision is significant with regard to the pedagogical atmosphere and the students' relation to preceptors. There are two different models of supervision: group supervisory approaches and individualized supervisory approaches (Henrikson et al., 2012). Most studies have shown that the students' satisfaction is dependent upon how the supervision is organized. Students who had the same supervisor all the time were more satisfied with the supervisory relationship than those who had different supervisors each day. Students' comments on the supervision confirmed the significance of the supervisory relationship (Sundler et al., 2014).

Premises of nursing care on the ward

The basic root of clinical learning environment is the ward and its characteristics as a physical and psychological environment. The content of the premises of nursing in the ward is one of the most important factors in a meaningful learning experience, and clinical learning, and nursing care should always be considered together (Saarikoski & Leino-Kilpi, 1999).

The premises of a nursing ward or ward philosophy is defined as a place where the patient receives individualized care, where there is sufficient information on patient care and nursing documentation and in which the relationship between students and staff and between patients and staff is clearly apparent (Tomietto et al., 2016).

The quality of the premises of nursing in the ward can be divided into at least two interrelating aspects, with each part interdependent: technical care, specified as the application of the technology and the knowledge of health science to the

management of health problems with maximized health benefits without increasing risk; and interpersonal operation, specifically, the psychosocial interaction between patients and health workers (Iyigun et al., 2020).

Patient-nurse interaction is a major aspect of nursing. This quality in the interpersonal domain is measured by the degree of continuity of the socially accepted values, which are strengthened by the ethical principles of health professions, and expectations of individual patients. The variables related to patient-nurse interactions include: the actors' (nurse and patients) communication, the environmental context for contact, the process of interaction, and the patient health outcomes (Nakrem, 2015).

Management leadership style

A variety of factors affect the processes and the quality of structures, which indirectly alter the results for the individual patient, or the outcome of the health services when the quality of the hospital ward is being assessed. Three quality territories should be considered: the structure quality, which includes the quality of the structural factors that affect the efficiency of care; the management quality, or the quality of the direct care provides by the staff; and the result quality, which includes the impact of the care services outcome for the patient and the health service (Azaare & Gross, 2011).

The management leadership style is defined as a ward manager who appreciates his or her nursing staff, acts as a ward team player, and provides a good attitude and feedback to students. Nursing leadership is considered to be a fundamental component in driving the teams' motivation, satisfaction effectiveness, and job performance. Hence, nurse management has an important role in the hospital and in health care and because of that, nowadays nursing management is regarded as a profession of its own, requiring special training, skills, and characteristics. With a good understanding of their own nursing leadership style, nurse managers will be more successful in managing their team/ward and finally provide better care services (Calpin, 2003). The most effective leaders in nursing management understand that nursing staff and nursing students are learners who

are going through their practical part in hospitals, and patients benefit from the unit acting as a team (Henrikson et al., 2012).

Nurse teacher

From 1992 onwards, the importance of the role played by nurse teachers from nursing colleges in higher education was recognized, because nursing students within their higher education required more than just theoretical classroom teaching, and needed professionally trained people who could encourage students to link theory with practice, and who could provide education and support for students whose objective was to ensure they are reliable within their clinical setting (Gillespie & McFetridge, 2005). Since then, nurse teachers have felt the need to balance their roles as teachers, administrators, researchers, and clinical supporters for students.

The term “nurse teacher” is used to define a teacher who is responsible for both the theoretical and clinical teaching and who enables the integration of theory and practice. This educator leads the development of clinical practice and provides support and cooperation with clinical mentors and establishes a good relationship among students, mentors, and nurse teachers, enabling students to meet learning outcomes and develop appropriate competencies (Chappel, 2016).

The quality of clinical learning environment is a key element to assess the quality of the students' clinical experience and is vital for the educational process. Thus, there is a need for powerful, multilingual instruments with high validity and reliability to assess the quality of clinical learning environment and improve nursing education, all around the world (Skaalvik et al., 2011).

Early research focused more on the clinical learning environment during the early 1980s, whereas later studies at the end of the 1980s focused on the meaning of the supervisory relationship. During the 1990s, an important new topic emerged: the relationship between the students' experience and the level of nursing care on the ward. This question was further analyzed in the studies of the 2000s. However, the majority of research involving clinical learning environment and

supervision has mainly focused on students' experiences on clinical sites, such as hospitals (Witte et al., 2011). Several survey instruments have been developed to assess the students' perceptions of clinical learning environment, which include quantitative, qualitative, and mixed methodology. Up to now, eight instruments have been developed to estimate the clinical learning environment in the world (Bos et al., 2015). The most popular among them are:

1) The Clinical Learning Environment scale (CLES scale), proposed by Dunn and Burnett, was the first instrument and was developed in Australia in 1995. This instrument is especially focused on cultural relationships existing in health settings (Dunn & Burnett, 1995).

2) The clinical learning environment inventory (CLEI) was developed by Chan. The CLEI scale promoted a thorough in-depth literature review on classroom and other educational learning environments such as colleges and universities (Chan, 2003)

3) The clinical learning environment, supervision, and nurse teacher (CLES+T) instrument has been extensively used throughout Europe (Saarikoski et al., 2008).

4) The Nursing Student Satisfaction Scale (NSSS) provides a theory-based approach to the measurement of nursing student satisfaction (Chin Chen et al., 2012).

However, only a few of them like NSSS and CLES+T have been the subject of further research (Vizcaya-Moreno et al., 2015). In this study, we selected the CLES+T instrument because it is mostly focused on the evaluation of the learning experience of student nurses in clinical placements.

1.1 The Iranian nursing education system

Iran is located in the Middle East and the country's total area is 1,648,195 sq. km, which makes it the 17th largest country in the world. The population is around 81,824,270 (July 2015 est.) and Tehran is the capital and largest city of the

country. The official language is Persian and around 99.4 % of the population is Muslim. The country contains thirty-one provinces. In each province, there is at least one Medical Science University (MSU), although a few provinces, which are overcrowded or are geographically large, have more than one. These MSUs, as the main approved authorities, hold the double responsibility of preparing the higher education to the healthcare system. Each MSU runs at least one full-time basic nursing program (Tabari Khomeiran, 2007).

The specific geographic location of Iran, the mass immigration from Afghanistan and Iraq, the Iran-Iraq war, and the insecurity that followed have all affected the health system in Iran. Although the major burden of disease in the country is non-communicable, the country is still faced with infections related to its neighboring countries (Jamshidi et al., 2016).

The expansion of nursing in Iran has been influenced by cultural, historical, economic, and religious variables, as like many other developing countries such as Lebanon and Taiwan. There is no reliable information about the exact date of organized nursing and nursing concepts according to historical studies of modern nursing education in Iran. But it seems that a long time ago there were women who were called “Bimardar” and who took care of the patients in state health centers called “Darolshafa”. These women did this voluntarily and had no formal training to care for the patients (Mohammadi et al., 2014).

Early in the 18th century, Iran was influenced immensely by European countries and the US, and in 1915, the first nursing school was established in Urmia, a city in the North-West of the country and one year later in 1916, an American missionary established Iran’s first nursing school in Tabriz. The school mainly focused on the practical aspects of nursing and introduced a program that largely met the local hospitals' needs. Alongside nursing, they emphasized the teaching of English, and only female students were accepted and trained at the school. The graduates from the Tabriz school contributed significantly to the American model of nursing (Tabari Khomeiran, 2007). The Tabriz nursing school remained the only nursing program in Iran until 1935 when the government established four new nursing schools in four megacities of Mashhad, Shiraz, Rasht, and Tehran,

the graduates of which were called doctor assistants because doctors had a higher place in the community (Yosefi et al., 2015).

Over the years, in the UK the system of nursing education was influenced by Florence Nightingale who had a big impact on nursing practice. Under the influence of British-trained nurses, Iran's nursing education system shifted slightly from the American nursing model to the British nursing model. Therefore, the Iranian nursing system was just as affected by Florence Nightingale as the western countries (Nasrabadi et al., 2003).

The Islamic Revolution in 1979 and its following "Cultural Revolution" led to many changes in the higher education system. Immediately after the imposed war of 1980-1987, between Iran and Iraq, the demand for professionally trained nurses increased significantly, and there was an urgent need for nursing and nurses. As a result, some nursing schools in small cities were organized in order to train as many nurses as possible and the duration of the nursing program was reduced to 2 years to be able to meet such urgent demands (Mirzabeigi et al., 2011). Another change in the Iranian nursing education took place in 1987, and the two-year programs were canceled, and the four-year nursing program was implemented as the standard nursing education. The second change occurred with the increasing number of male students who were motivated to choose nursing as their profession. Under the influence of the Islamic Revolution as mentioned earlier, they believed that nursing care might be improved if provided by nurses of the same gender as the patients (Mohammadi et al., 2014).

In 1985, the medical department of the Higher Education Ministry was merged with the Ministry of Health, and Medical Education was set up. However, since the late 1980s, there had been great concern due to the lack of enough budget and the increasing number of nursing graduates as a result of improving the government's acceptance criteria for nursing students (Mirzabeigi et al., 2011).

Iranian students of all disciplines including medical and medical-related courses such as nursing education who wish to enter university are required to pass the competitive National Higher Education Entrance Exam (NHEEE), because of the limited number of university places and the large number of general applicants

(Rassouli et al., 2014). The Ministry of Health & Medical Education (MoHME) sets a national standard for the nursing education curriculum in the whole country and all nursing schools must consider the plan when implementing nursing education activities. But each university might have its own guidelines consisting of learning and teaching methods, evaluation, and examination requirements (Tabari Khomeiran, 2007).

The nursing education in Iran includes basic, general, and specialized courses. The basic course encompasses anatomy, physiology, and pharmacology, while in the general courses subjects such as literature, religion, etc. are incorporated into the system as required by the Iranian and Islamic culture. The specialized courses, which are influenced by the western model and are disease-oriented, are divided into some subgroups such as inner nursing and surgery, obstetrics and gynecology, children, psychiatric nursing, and community health. At the undergraduate level, the students are required to pass 137 theoretical credits successfully and later they are expected to spend 51 hours in hospitals for each course. Iranian graduates are automatically considered as registered nurses (RN) without taking any exam (Rassouli et al., 2014).

In Iran, nursing programs are available at all levels of higher education from bachelor to doctoral degrees. However, unlike some western countries, Iran does not differentiate between the rank of licensed nursing personnel, and Registered Nurses (RN). In 2002, the Iranian Nursing Organization (INO) was established in order to organize, acknowledge, and improve Iranian nursing education. Nevertheless, the nursing acknowledgement is not enough to ensure a healthcare system of quality (Baraz et al., 2015).

The different types of nursing education in Iran include:

Komak Behyar: associated nurse assistant, in terms of hospital structure, is the lowest-ranking member of the healthcare team in direct contact with patients, who is generally employed to satisfy the patients' needs by performing basic nursing tasks. They are trained in hospital-based courses for two to six months under registered nurses' supervision.

Behyar: to a large extent, it is equivalent to the auxiliary nurse in other countries. The Behyar is able to provide primary nursing care autonomously and also more advanced nursing care under RN supervision. They are trained for a one-year period after obtaining their high school diploma. In some wards, such as outpatient clinics, and in some less developed areas of the country, the Behyars are the primary nursing workforce who can provide nursing care (Pezeshkian et al., 2003).

Baccalaureate programs: In Iran, the baccalaureate plan is the fundamental nursing program at the higher education level and the only way to be a professionally registered nurse. This procedure aims to build competent nurses with essential technical skills, theoretical knowledge, and academic thinking to make high-quality general nursing care available. As with all the other university-based programs, high school graduates are admitted to these programs on the basis of their ranking in the Competitive Entrance Exam. Currently, the baccalaureate nursing program lasts for four years with at least 130 credits, and the learning environment for students is shared between classroom, hospital, community, and other educational settings. The percentage of classroom time in the total program is about 40%, hospital time is about 54% and laboratory setting activity is about 6% (Amini et al., 2016).

The clinical training program in nursing at the bachelor's level is completed throughout the first three years, as follows: basic nursing care is lectured in the first year; medical/surgical care is taught during the second and third years; and community and mental health care is taught in the third year. The program concludes with a full-time practice at the final year of the curriculum. The full-time practice is devised to enhance the students' self-esteem and familiarize them with real working conditions and the development of time management skills. Upon successful completion of their four-year program, the graduates are granted the Bachelor of Nursing degree, which is the minimum legal and educational requirement for professional nursing practice in Iran (Tabari Khomeiran, 2007). The Bachelor's degree curriculum is the same in all Iranian universities and has been repeatedly upgraded over the past decades to ensure that the graduates'

comprehension and science learning requirements are met to provide high-quality health care (Yazdannik et al., 2017).

Master of nursing: The first master of nursing program in Iran was established in 1988. The purpose of the master of nursing program consists in training qualified nurses who are able to work as nurse educators, health care delivery settings managers, and clinical researchers. In order to register in a master of nursing program, the applicant must hold a Bachelor's degree in nursing and must have successfully passed the entrance exam. The exam includes basic nursing areas, such as adult medical-surgical studies, obstetrics, gynecology, pediatrics, and community health nursing; the applicant's ability to read and comprehend nursing professional literature in the English language is also assessed (Amini et al., 2016).

In 2004, there were only 14 students enrolled in the Master of Nursing program and mostly in bigger cities but nowadays almost all the nursing universities accept students at this level. The master of nursing is a three-year course and clinical program with 43 compulsory and optional credits in total. Master of nursing degrees are available in two fields: nursing education and nursing management. Each field has four different specialties, including medical/surgical nursing, mental health nursing, pediatric nursing, and community health nursing. Master of nursing curricula focus mainly on educational units rather than practical units (Karimi et al., 2013).

Doctoral program: It should be noted that university professors in Iran generally hold master's or PhD degrees in one of the specialized majors of nursing courses. The nursing doctorate or PhD is the highest level of education in this field and the graduates normally work in research centers and universities (Amini et al., 2016). The first doctoral nursing program in Iran was implemented in 1995 at the Tabriz University of Medical Sciences and at that time only three students were enrolled in the program but nowadays most universities run the PhD program (Heydari & Lotfi Fatemi, 2015).

There are seven different programs for a PhD in nursing. These programs are 4-5 years in length and include 52 credits, including 20 credits for thesis. The

students accepted in the doctoral programs are master of nursing graduates who have been successful in both an annual competitive nationwide examination and an interview with a panel of nursing experts. The purpose of the doctoral program is to provide graduates with a lifetime of mental investigation and creative research and to further the development of nursing knowledge in Iran (Tabari Khomeiran, 2007). The PhD graduates are expected to be able to determine the challenges in nursing and contribute to improving the quality of nursing care as experts (Heydari & Lotfi Fatemi, 2015). The nursing PhD course in Iran is similar to that of the United States and Britain in that it is research-based but in Iran there are more working and practical courses than in the United States (Amini et al., 2016). Nursing education in Iran has improved in recent years and faces many opportunities in the future, but it also faces many challenges. In this regard, a set of purposeful actions in the area such as nursing curricula is needed if further improvement on nursing education is aimed (Tabari Khomeiran, 2007).

The challenges of nursing education in Iran can be summarized in three groups:

1) Quality: the content of nursing in Iran is mostly influenced by western methodology and lacks any native outlook. On the other hand, there are no attempts to enhance the holistic view toward the patient, and the trainers often lack concentration with regard to the content of health care which is the central notion of this field.

2) Clinical environment for students: it is not suitable for nursing students, in other words, the goal of clinical practice is granting the nurses with enough knowledge concerning bedridden patients but the lack of suitable facilities in accordance with the students' educational needs, the lack of appropriateness between the educational space and some students and also a deficit in experienced faculty members who can provide clinical training, have become serious challenges for students to reach their study goals (Heydari & Lotfi Fatemi, 2015).

3) Differences between theoretical courses and practical courses. In fact, while the educators are young, the theoretical courses in classrooms are modern and based on the latest knowledge, but clinical training is very traditional. Accordingly, it can be said that there is a kind of division between clinical environments and

nursing schools in Iran, and the interaction between departments' staffs and nursing trainers is ineffective and has no contribution to achieving the clinical goals (Karimi Moonaghi et al., 2013).

One of the issues that most educational systems are concerned with is the gap between theory and practice in medical sciences which is especially felt in nursing studies. Students are not able to use their scientific reserves despite taking many theory courses in clinical situations. Moreover, despite the fact that clinical education accounts for half of the training period it is not a measure of students' ability to do practical work at the bedside, as it should be (Heydari & Lotfi, 2015). Therefore, evaluating the performance of clinical education and student satisfaction with this method is very important.

From 2011 onwards, some principles of nursing education have started to improve, such as community-based education, competency-based education, problem-based learning, and solving and student-centered education. Despite irrefutable advancement and many changes in nursing education, faculties have faced some problems in the process of nursing professionalization and the treatment of nurses and their habits are still largely based on traditional approaches. Most of the graduate nurses, unfortunately, cannot make decisions in critical moments and they have professional fear when they finish university (Mirzabeigi et al., 2011).

According to an Iranian study, nursing students have multiple problems; they have not accepted themselves as nursing students, they have issues with their professional identity, and have no interest in their profession. Many of them do not accept their nursing profession even until the end of their studies and most students are not adequately prepared to work in the clinical setting. The study shows that there are clear contrasts between Iranian nursing students and educators whose abilities are doubted by the students (Yousefi et al., 2015). Nursing education problems exist in most countries such as Iran and the fact that the textbook descriptions of the clinical situation do not match the reality of practice in the workplace is an ongoing problem faced by members of the nursing profession and is commonly referred to as the theory-practice gap (Mirzabeigi et al., 2011).

In order to solve the existing problems in nursing education, many faculty educators and administrators in nursing education are interested in knowing what the most important problem and gap in the nursing faculty is. And they are also interested in knowing what is happening in the academic education environment. Most of the Iranian research studies have been rare or have only been conducted in one faculty, therefore, they have not achieved comprehensive results (Nasrabadi et al, 2004).

It is obvious that in Iran the theoretical part of teaching is stronger than the clinical part and most of the nursing faculty members believe that the importance of education is in the development of nursing as a profession and science. Unfortunately, by paying extreme attention to the theoretical parts, the clinical training has almost been ignored (Nasrabadi et al., 2003).

Nursing is a practice-oriented discipline but unfortunately, educators spend all their energy in planning the theoretical courses, and the faculty administrators usually appoint the best teachers to provide the theoretical courses, although the most important approach to having professional nurses in the future is to enhance hospital-based training right beside the university education. Moreover, educators and administrators have to keep in mind that clinical training plays a fundamental role in nursing students' acquisition of professional capabilities (Yazdannik et al., 2017). In general, the goal of nursing education at the bachelor level is to educate nurses with the ability and quality to work as members of a health team by providing healthcare services, research, education, consultation, managing rehabilitation and promotion of individuals, families, and community health (Yang, 2019).

As we explained previously, clinical education in Iran constitutes more than half of the formal educational courses in nursing. Many studies have shown that nursing education systems in Iran do not have a proper functioning and students are not satisfied with learning the required care for patients and necessary skills for nursing employment (Jahanpour et al., 2016). In recent years, nurses have been criticized by the government and the people of Iran because of their poor quality of patient care. This criticism has resulted in an increase in the number of studies about the nature and quality of students' clinical learning. Regarding the

liability and the role of nurses in maintaining and promoting health in the community, special attention should be paid to the quality of education and student nurses' learning. Students are invaluable sources of information about the quality and the effectiveness of educational endeavors (Bahmani et al., 2011).

The most important step to develop continuing nursing education is to study nursing students' perceptions and to find the impacts of educational programs in bachelor's degrees in different countries, faculties, and schools which lead to an enhanced educational performance (Musabyimana et al., 2019).

1.2 Instrument development

Mikko Saarikoski, a researcher from Finland, reviewed all researches about nursing students' learning environment published from 1990 to 2002 at the hospital setting and then created his own questionnaire. The reason for this study was that in Finland, there is not a valid research scale available to study clinical learning environments and supervision. Moreover, in the international nursing literature, there was only a limited number of instruments available to assess the quality of the nurse education system in clinical practice. The approach adopted in his study was quantitative (Saarikoski et al., 2007).

Clinical teaching and learning in nurse educational systems have been tested from different landscapes during the last two decades. However, the studies haven't made a consistent theory of clinical teaching. The target of this study was to qualify how nursing students experience their clinical learning environment and the supervision given by staff nurses, and assess what is experienced by students in different clinical units, which is complex. To assess this complexity, the Clinical Learning Environment and Supervision (CLES) evaluation scale was used (Saarikoski et al., 2002).

The results of this pilot study were used to develop the basic research instrument. This was tested in the wide Finnish sample. In the pilot study there were seven main items in the questionnaire, which were made up of 50 statements. All themes were obtained from the results of experimental studies. The outcomes of

the pilot study were reviewed in order to expand a research instrument. The result from the literature review, the pilot study and analyses of audit instruments decreased the final number of sub-dimensions of CLES to five (Saarikoski et al., 2008).

The five dimensions were: ward atmosphere, leadership style of the ward manager, premises of learning on the ward, premises of nursing on the ward and the supervisory relationship. In 2002 the instrument theoretically published, the scheme used a 4-step scale and consisted of 33 items, sub-divided in four categories. After the revisions (resulting from the pilot study), the CLES was used in two different samples in Finland with 416 sample size and southern England with 142 sample size (Saarikoski & Leino-Kilpi, 2002; Saarikoski et al., 2002).

Both in Finland and in the UK, data were collected among nursing students from second year onward when the nurse training program begin with theoretical studies and with clinical practice. In both countries, the sample was made up of nursing students in the middle phase of their training program. All samples were chosen in hospital setting.

The actions, which were used in this confirmation of validity and reliability, were:

- (1) The evaluations of results of pilot study.
- (2) The use of an expert panel.
- (3) Test-retest with a small sample.
- (4) Selection of a criterion-related instrument. In both studies, content validity, face validity, concurrent validity, construct validity and internal consistency reliability were measured and confirmed (Saarikoski & Leino-Kilpi, 2002).

The CLES instrument was translated using specific three-step procedure to supply semantic equivalence. Also, the CLES was translated using the main author who built the CLES questionnaire and a bilingual (native English-speaking) language teacher. The final verification and adjustment of concepts used in the CLES was made by a native English-speaking nurse teacher who

worked in the UK so that nursing students could understand these concepts by reading them only once (Musabyimana et al 2019).

The fifth dimension, the role of the nurse teacher, was included by the originators Saarikoski, in the 2008 version as a result of further theoretical discussions, scale revisions and empirical studies. It was used in Finland for the first time. Afterward, it has been translated into several languages and used in different countries. The international spread of this study was essential for two reasons:

(1) To scale the development processes, including testing the new instruments in different nursing cultures.

(2) To assess the impact of the European Union (EU) integrated healthcare educational system (Papastavrou et al., 2016).

For example, it has been used in New Zealand, Germany, Norway, Holland, Sweden, Spain, Greece and Italy. There are 23 language versions of the CLES and/ or CLES+T scales and a researcher link over 40 countries. It has proved to be a valid and reliable tool among different international samples. The clinical learning environment, supervision and nurse teacher (CLES+T) instrument was used extensively in Europe (Warne et al., 2010).

The purpose of this instrument is to describe the students' perceptions of the clinical learning environment. Psychometric properties of this instrument make it valid for international comparison of the quality of clinical learning environments (Carlson & Idvall, 2014). CLES+T instrument properties and strength include: internal reliability, rationales for psychometric properties, adequate sample size, validations for international comparison, and specific characteristics for clinical environment inventory (Jonsén et al., 2013).

The CLES+T instrument consists of 34 items defined in 5 dimensions that were identified in the psychometric testing: pedagogical atmosphere (9 items), supervisory relationship (8 items), premises of nursing in the ward (4 items), leadership style of the ward (4 items) and the role of nurse teacher (9 items). Each CLES+T item evaluates on five-Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) (Saarikoski et al., 2008). In 2009, Saarikoski

added a student satisfaction subscale to the CLES+T questionnaire. This consists in assessing the student rate satisfaction on three items which, taken together, can give a score for total satisfaction with the clinical placement. The satisfaction subscale includes three items of which two are taken within the actual tool:

- “The ward can be regarded as a good learning environment” (pedagogical atmosphere domain)
- “Overall, I am satisfied with the supervision I received” (supervisory relationship domain)
- The item “I am satisfied with the clinical placement that has just ended” was added to the satisfaction subscale. Thus, the questionnaire has 35 items in total and six subscales (Warne et al., 2010).

2 Objectives

We conducted this study for three main and specific objectives:

1. To investigate and describe the clinical learning environment, supervision and attendant instructor scale in 10 countries (Germany, Belgium, Norway, Croatia, Nepal, Oman, Hungary, Czech Republic, Lithuania and Romania) of three different regions all around the world.
2. To translate the clinical learning environment, supervision and nurse teacher scale (CLES+T) to Persian language.
 - To describe the cultural adaptation of the Persian version of clinical learning environment, supervision and nurse teacher (CLES+T) scale with the Iranian nursing education system.
3. To validate the Clinical Learning Environment, Supervision and Nurse Teacher (CLES+T) questionnaire among Iranian undergraduate nursing students.

3 *Methodology*

In this chapter, the methodology of the study is presented in 3 main sections. We are going to explain the methodology of each variable separately for a better understanding.

3.1 Methodology for the objective: To investigate and describe the clinical learning environment, supervision and attendant instructor scale in 10 countries.

Nursing students' perception regarding the clinical education has been assessed in many different countries, no studies or systematic reviews have been reported assessing this instrument between different countries with different situations. The general objective of the study was to assess the learning environment from the point of view of the nursing students in different clinical settings on the basis of cultural diversity, as well as the differences in educational systems and structure of the clinical training.

Design and process

This aim was carried out by a systematic review of the literature by preferable reporting factors for systematic reviews and meta-analysis (PRISMA) guidelines (Mikkonen et al., 2016). PRISMA is a guideline brought out by an international group of experts on intervention and methodology to make strong reporting systematic reviews and meta-analysis (Mansutti et al., 2014).

Inclusion criteria

Articles were chosen for this study by using predefined process:

- a) The articles which were published between 2002 and 2017.
- b) The articles which were published in valid journals.
- c) Both national and international articles.
- d) Articles only written in English language.

e) The target population consisted of nursing students of any age or gender.

Research strategy

The research strategy was limited to the past 16 years and applied to Medline via PubMed and also Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases. We also used special citation tracking databases (Google scholar and SCOPUS) to identify additional articles and data as needed. The keywords used were: “clinical learning environment”, “nursing student evaluation”, “CLES+T scale”, “psychometric test”, and “nurse education”.

Study selection

At first, two researchers reviewed all the topics and abstracts and recognized potentially relevant findings and articles, then removed duplications separately; next, they discussed together, read every single applicable article in full content and recognized the last reports incorporated into the audit.

Data extraction and synthesis

Thematic or presentative synthesis was used for data analysis and the explanation of the result as well as to avoid bias. The philosophy of the thematic synthesis answers the review questions with most efficient knowledge. No specific software was used in the thematic synthesis.

The three following phases were carried out for presentative synthesis:

- (a) Collect original studies.
- (b) Choose relevant topics.
- (c) Create analytical themes (Mikkonen et al., 2016).

To avoid mistakes, the discussion and conclusion parts of each study were reviewed using the research main theory as a guideline. The presentative synthesis was conducted by one researcher.

Data extraction was performed by the same researchers considering the following details: author; year of publication; country where the study was performed; year of data collection; study design; sample characteristics; setting (e.g., hospital); validated instrument, type and effect of outcomes; results and limitations (Park & Calamaro, 2013; Conley & Redker, 2016)

Methodological quality evaluation

The quality of a tool is based on its evaluated psychometric properties and on how these attributes have been investigated. Clinical learning environment, supervision, and nurse teacher (CLES+T) is a reliable study scale for quality warranty of clinical learning environment of nursing students and psychometric properties. Interior consistency, unwavering quality (counting test-retest dependability, inter-rater dependability and intra-rater dependability), estimation mistake, content legitimacy (counting face legitimacy), auxiliary legitimacy, speculations testing (counting joined legitimacy), paradigm legitimacy, and culturally diverse legitimacy, have been approved and globally announced in Germany, Italy, Netherlands, New Zealand, Spain, Sweden and Norway (Warne et al., 2010).

Selection process

Our search and study selection process (PRISMA fig 1) identified 311 records, of which 111 were duplicates. Out of the remaining 200 records screened by abstract and title, 168 records were excluded because 80 of them did not use CLES+T questionnaire, 68 were not relevant to the aim of this study and 30 records were not used for nursing students. The remaining 32 full-text articles were assessed for eligibility. Twenty-five records were excluded because they were not relevant to the aim of this review according to the chosen countries and in total 7 studies were incorporated into this review to assess the clinical learning environment in 10 different countries including: Germany, Belgium, Norway, Croatia, Nepal and Oman in a separate article for each one as well as one article

for four Eastern European countries (Hungary, Czech Republic, Lithuania and Romania).

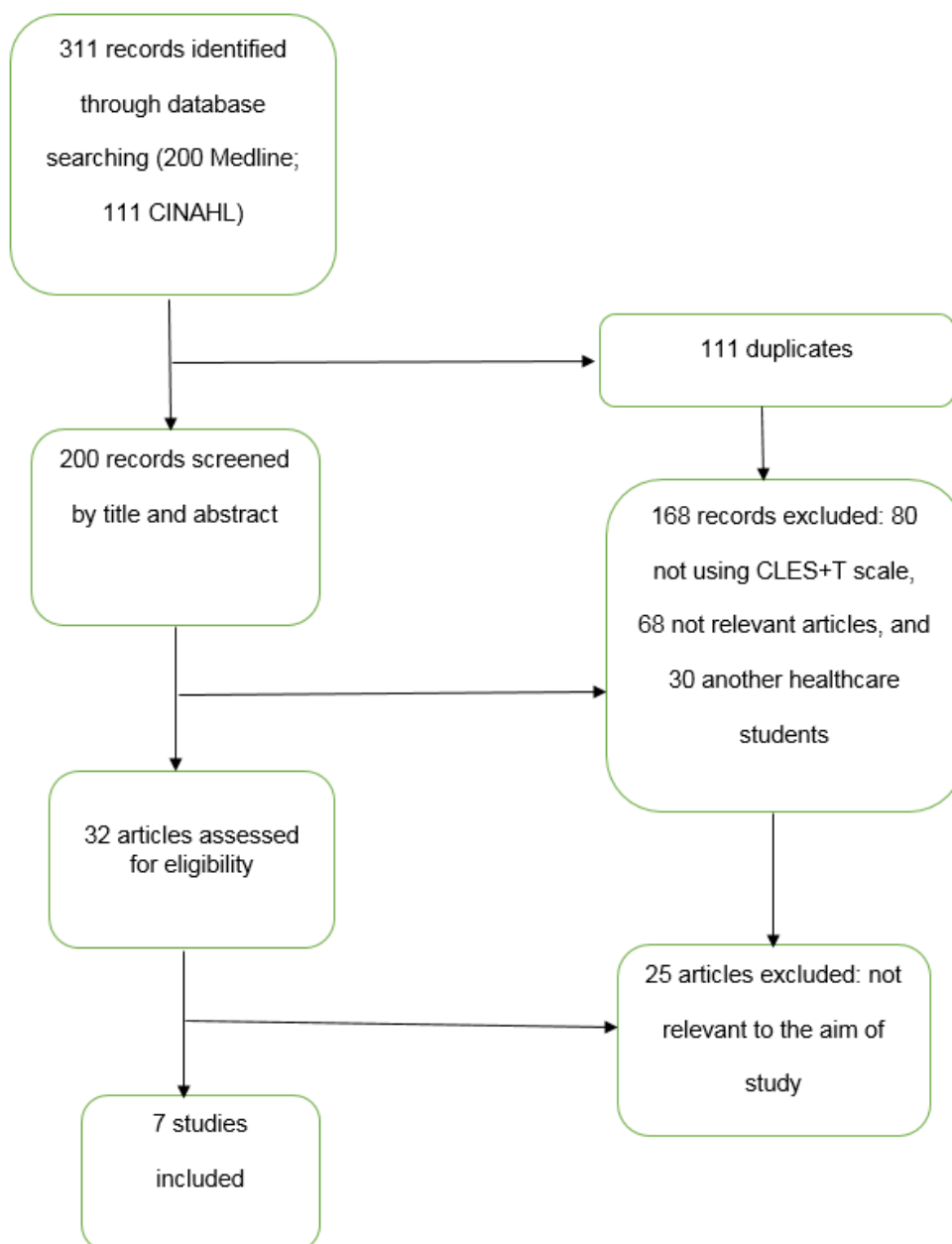


Figure 1. Details of literature search and study selection. PRISMA flow diagram.

3.2 Methodology for the objective: To translate the clinical learning environment, supervision and nurse teacher scale (CLES+T) to Persian language.

This section of methodology is related to the second objective, it is a part of a cross-sectional study which was carried out in 2018-2019 to evaluate if the CLES+T scale was suitable for the investigation of the clinical education within nursing programs at four Iranian universities. In the first stage the researcher sent the request of authorization to the original author Doctor Mikko Saarikoski, to give his permission to use and translate the questionnaire in Persian language and once his permission was confirmed we started the translation. This authorization is attached at the end of the thesis (Appendix 1).

Inclusion criteria:

We selected for the translation step:

Individuals who had the following inclusion criteria: fluent in both languages Persian and English, more than 25 years old regardless of the gender, some of them with healthcare background for at least two years.

The individuals for the expert panel needed to have more than 15 years' working experience in nursing education and practice in an Iranian University.

The individuals for the pilot test were Iranian nursing students studying 2nd to 4th levels, regardless of age, gender and ethnicity.

Procedures for the translation and adaptation

All the following steps are correlative; one step starts once the previous one has been finished.

Instrument translation

The first step was a translation of the original English version of CLES+T questionnaire (Appendix 2) into Persian version. For this step, we selected four independent translators that were native speakers of Persian language; however, they were also fluent in English. Two of them were healthcare professionals and the rest of them had no medical background. All of them were aware of the main goal of the study.

Acquiring the first consensus of the Persian version

For the synthesis of the translation and achieving the first consensus of the translated version, the researcher had a meeting with the translators. They investigated all four translated versions and compared all the items between these four versions and the original English version to preserve the equivalence with the original instrument. Then the researcher created the single instance of the Persian version (Appendix 3).

Evaluation by the expert panel

The consensual Persian version was evaluated by the expert panel, which consisted of four experts in nursing education. All of them have been working in Iranian universities as professors with more than fifteen years working experience. They evaluated each item semantically, culturally and conceptually. Descriptive analysis evaluating the percentage regarding the relevance of the items.

Back translation

It was performed by one independent translator who is fluent in English and Persian and had knowledge of Iranian culture. This translator did not know anything about the research objective or the original instrument. After that, the

researcher compared this English version with the original instrument to verify the semantic differences. The purpose was to achieve the consensus on equivalent terms of the original version.

Semantic analysis of the item

Ten nursing students according to the inclusion criteria of the study had been chosen in January of 2019 in order to evaluate all the items of the questionnaire according to their comprehension and understanding.

Review of comprehensibility by pre-test

35 Iranian nursing students with experience in clinical practice as part of their curriculum were selected. The adapted questionnaire was filled out by the selected students in order to check their understanding and acceptance of each item. Internal consistency and reliability of the questionnaire were assessed in the pilot test.

3.3 Methodology for the objective: To validate the Clinical Learning Environment, Supervision and Nurse Teacher (CLES+T) questionnaire among Iranian undergraduate nursing students.

The most important step to develop continuing nursing education is to study nursing students' perceptions and to find the impacts of the educational program on the bachelor degrees in different countries to improve the educational performance. Iranian studies in this field are rare.

This is a descriptive cross-sectional study, with 325 second, third and fourth year nursing students from 4 universities in Iran. The tool used in this study was the Persian version of CLES+T instrument which includes two parts; in the first part of the questionnaire, we assessed the demographic data, background variable and the satisfaction rate. The second part of the questionnaire is the Persian

version of CLES+T with 33 questions in 5 dimensions: pedagogical atmosphere on the ward (8 questions), leadership style of the ward manager (4 questions), nursing care on the ward (4 questions) supervisory relationship (8 questions) and the role of the nursing teacher (9 questions). The total score for each item is 5 and they are scored using the 5-point Likert Scale from score 1 (fully disagree), score 2 (disagree to some extent), score 3 (neither agree nor disagree), score 4 (agree to some extent) and score 5 (fully agree).

Data collection

In this descriptive cross-sectional study, participants were all nursing students in second, third and fourth year which had clinical practice according to their curriculum from two public universities and two private universities in the north of Iran and Tehran. An information letter (Appendix 4) was sent to the administrators of the nursing schools in order to explain the main objective of our study and in order to ask for their contribution to this study. Data collection was carried out by a nurse with a master's degree from January 2019 to March 2019, the questionnaire was distributed among the students as they reached the end of their clinical practice personally.

The main objective of the study was explained to the participants and the explanation included enough detail to allow students to agree to participate in the study or not (Appendix 5). During the data collection phase, the respondents' right to privacy and anonymity were fully protected. The respondents gave their response by code without personal information.

This study was conducted in seven different departments: emergency, gynecology, surgery ward, CCU, ICU, internal ward and pediatrics. In the first part of the questionnaire we added some demographic data and data related to the monitoring of the students' situation but the main part of the questionnaire was related to the clinical learning environment, supervision and nurse teacher (CLES+T) instrument.

Sample size

Previous studies (Vizcaya-Moreno et al., 2015; Gaskin and Happell, 2013) have assembled guidelines for organizing the essential sample size. The most important regulations are: A) sufficient sample size (there should be more than 100 participants); B) a minimum ratio of participants to variable 10:1. In order to obtain an acceptable sample size in our study for factor analysis of CLES+T instrument, a minimum of 340 students were required with at least 10 respondents per time (Gaskin, 2013; Viscaya Moreno et al., 2015).

Participants of this study were 325 nursing students in second, third and fourth year of study.

Inclusion Criteria

All students enrolled in the second, third and fourth year of the nursing program at the universities in the North of Iran and Tehran who have passed the clinical practice between October 2018 and December 2018, and who accept to participate in this study by signing the information consent (Appendix 6).

Exclusion Criteria

Nursing students at other levels of the nursing programs who did not pass the clinical practice within the specific time of our study (autumn 2018).

Validation

This validation is divided in 5 steps, step 1, 2 and 4 were calculated in objective two (to translate the clinical learning environment, supervision and nurse teacher scale (CLES+T) to Persian language) and we discussed about them in this part we talk about construct validity and reliability.

- 1) **Face validity:** face validity means that the test "looks like" it will work.

- 2) **Content validity:** is the extent to which the elements within a measurement procedure are relevant and representative of the construct that they are used to measure.

Face validity and content validity is performed by an expert group. Also, we assess the scales content validity by scoring the relevance of instruments items on scale of 1-3 where 1=not relevant 2=relevant but not necessary 3=absolutely necessary. Additionally, we have discussed together if any other items should be added to the scale or should be removed to achieve the adapted questionnaire.

- 3) **Construct validity:** to be assessed statistically by means of the principal component factor analysis (PCA) with varimax rotation and by exploratory factor analysis (EFA)
- 4) **Psychometric testing:** the adapted questionnaire was pilot-tested using the instrument among 34 college students who had experience in clinical practice as part of their curriculum in order to calculate the validity and reliability of the study.
- 5) **Internal consistency and reliability:** it is a measure based on the correlations between different items in the same test (or the same subscale in a larger test). It has been carried out by Cronbach's alpha coefficient.

Study variables

Sociodemographic and other relevant variables will be collected:

Demographic characteristics:

- 1) Age
- 2) Gender

Background variables:

- 1) Educational background as a nurse assistant
- 2) Previous working experience at the patients' bedside.

Educational variables:

- 1) Academic semester
- 2) Ward type
- 3) Length of clinical placement
- 4) Satisfaction level of clinical placement which has been recently ended

Data analysis:

Descriptive statistics (frequency and percentages) by excel was used for demographics and characteristics of data. Descriptive analysis was also carried out through means, standard deviations and frequencies to describe the study sample, as well as skewness and kurtosis with the critical value ± 1.96 .

The reliability of the instrument was estimated with Cronbach's alpha coefficient to examine the internal consistency of the Persian version of the instrument and each sub-dimension. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. However alpha level should be $>.80$ to be considered reasonably reliable (maxim, 1999). For the statistical analysis the software package SPSS V 15 was used. The construct validity of CLES+T scale was assessed by Exploratory Factor Analysis (EFA), and the Bartle's Spherity test ($P<0.001$) showed that the correlation coefficients of the correlation matrix were different from 0. Kaiser-Mayer-Oklin was used to determine the relationship between variables. Confirmatory Factor Analysis (CFA) was used to check the relationship between factors of questionnaire or verify the internal structure of the adapted CLES+T as well as to estimate the parameter and the maximum likelihood. Likelihood ratio of the chi-square was $P<0.05$.

Ethical considerations

This study was conducted according to the principles of the Helsinki Declaration and according to the current legislation (Royal Decree 223/2004). It started after having obtained the approval by the reference Ethics Committee from the

University of Iran and the approval of the directors of the Nursing Schools. The participants were informed orally and in writing. Permission letters of using CLES+T scale were sent to the author of the original version of the CLES+T (Saarikoski) (Appendix 1). Confidentiality and anonymity were preserved throughout the study by using a code for each student.

4 Results

In this chapter, the results of the study are presented in three main sections according to three main objectives.

4.1 Result for the objective: To investigate and describe the clinical learning environment, supervision and attendant instructor scale in 10 countries.

The review includes 7 cross-sectional studies (Henriksen et al., 2012; Witte et al., 2011; Bergjan & Hertel, 2013; Antohe et al., 2016; Lovric et al., 2016; Nepal et al., 2016; D'Souza et al., 2015).

Five studies were carried out in Europe (Henriksen et al., 2012; Witte et al., 2011; Bergjan & Hertel, 2013; Antohe et al., 2016; Lovric et al., 2016) and two studies were carried out in Asia (Nepal et al., 2016; D'Souza et al., 2015). The objectives, participants, methods, and main findings of each of the 7 studies are summarized in table 1.

Author, year and country of design	Aims	Participants	Methods	Major finding
Bergjan & Hertel, 2013 Germany	To investigate the German version of CLES+T scale for evaluating student nurses' perception of their clinical placement	240 student nurses in their first, second and third year of bachelor program	German version of CLES+T questionnaire	The strongest factor is supervisory relationship

<p>Witte et al., 2011 Belgium</p>	<p>To obtain a reliable and valid Dutch version of the CLES+T that is in line with the Flemish culture and educational context</p>	<p>768 student nurses in their first, second and third year of bachelor program</p>	<p>Dutch version of CLES+T questionnaire (cross-sectional survey)</p>	<p>The CLES+T is a valid and reliable instrument to evaluate the quality of nursing wards as a learning environment in Flanders. Ward atmosphere and supervisory relationship identified as two important factors</p>
<p>Henriksen, 2012 Norway</p>	<p>To translate the CLES+T questionnaire and to evaluate the validity and internal consistency of the Norwegian version</p>	<p>407 student nurses from institutional practice settings</p>	<p>Norwegian version of CLES+T questionnaire</p>	<p>The instrument has properties suitable for evaluation within a Norwegian context. The role of nurse teacher, supervisory relationship and leadership style of the ward displayed identical</p>

				items and identified the most relevant factors
Antohe et al., 2016 Four moderately European unions (Hungary, Czech Republic, Lithuania, and Romania)	To explore the situation of clinical placements for student nurses and their satisfaction with the learning environment in new member states of the European Union	418 student nurses in four different countries (Hungary, Czech Republic, Lithuania, and Romania)	The quantitative study with CLES+T questionnaire	Students evaluated their clinical learning environment mostly positive and the most important factor was supervisory relationship, especially when they have individualized supervision
Lovric et al., 2016 Croatia	To translate the CLES+T scale to Croatian language and test the validity and reliability in practice	136 student nurses during the clinical practice	The quantitative study with CLES+T questionnaire	The translated version questionnaire is suitable for the evaluation of clinical practice for nursing students within a Croatian context, the most important factor is supervisory relationship

Nepal et al., 2016 Nepal	To examine Nepalese nursing students' perception of clinical learning environment in Nepal	263 student nurses in their second, third and fourth year	A cross-sectional study with CLES+T questionnaire	Students were satisfied with the clinical learning environment overall and the most influential factor was the pedagogical atmosphere
D'Souza et al. 2015 Oman	To evaluate the satisfaction and effectiveness of the clinical learning environment among nursing students in Oman	310 student nurses randomly selected	A cross-sectional descriptive design	60% of the nursing students were satisfied with the clinical learning environment and the most influential factor was supervisory relationship

Table 1 Characteristics of original studies (n=7)

Content validity. The content validity (including face validity) that is considered to be the first step to validate instruments, it means which components within a measurement procedure are relevant and representative of the construct that is used to measure (Johansson et al., 2010). The content validity was estimated positive in the 7 studies as reported in table 2.

Internal consistency. Internal consistency, the psychometric property assessing the relationship among elements, was estimated in 7 studies with excellent quality range. The study demonstrated the almost similar quality of Cronbach’s alpha of 0.76-0.96. Only in one study D’Souza et al., the internal consistency was not performed.

Structural validity. The structural validity findings, when reported, were consistent with the construct (dimensions) of the instrument. As reported in Table 2, some authors used Exploratory Factor Analysis (EFA); others used Principal Component Analysis (PCA) or both, whilst still others used Confirmatory Factor Analysis in addition to EFA and PCA.

Cross-cultural validity. In all studies, tools were forward- and backward-translated used only once.

Author, year and country of design	Content validity	Internal consistency	Structural validity	Cross-cultural validity
Bergjan & Hertel, 2013 Germany	Yes +	0.82-0.96	EFA, PCA	Forward- backward translation
Witte et al., 2011 Belgium	Yes +	0.80-0.95	EFA	Forward – backward translation
Henriksen, 2012 Norway	Yes +	0.83-0.96	EFA, CFA PCA	Forward- backward translation

Antohe et al., 2016 Four moderately European unions (Hungary, Czech Republic, Lithuania, and Romania)	Yes +	0.85-0.95	Chi- square	Forward-backward translation
Lovric et al., 2016 Croatia	Yes +	0.77-0.96	EFA	Forward-backward translation
Nepal et al., 2016 Nepal	Yes +	0.76-0.92	EFA	Forward-backward translation
D'Souza et al., 2015 Oman	Yes +	-----	ANOVA	Forward-backward translation

Table 2: Instruments evaluating the clinical learning environment quality in different countries

4.2 Results for the objective: To translate the clinical learning environment, supervision and nurse teacher scale (CLES+T) to Persian language.

There were 54 participants in total. Four of them were translators, one back translator, a four-expert panel and 45 nursing students were used for semantic analysis and pilot test.

Content validity

The four experts in nursing clinical practice, after reading the translation, confirmed that the Iranian version of the CLES+T questionnaire included 80%

relevant elements (cultural, idiomatic and semantic) which are important in nursing clinical practice and also demographic questions as variables, selected by the researcher and the expert panel considering the Iranian culture and education system. The ward manager in second dimension was renamed as head nurse (Table 3)

Item	Original CLES+T	Iranian version
Second dimension 10	The WM regarded the staff on his/her ward as a key resource	The Head nurse of the ward regarded the staff on ward as a key resource
11	The WM was a team member	The Head nurse of the ward was a team member
12	Feedback from the WM could easily be considered as a learning situation	Feedback from the Head nurse could be considered as a learning situation

Table 3: Dimensions and word renamed

Semantic analysis

The adapted questionnaire was tested using the instrument among 10 college students with clinical practice experience as part of their curriculum. The Iranian version of CLES+T consists of 33 instead of 34 items (item “There were sufficient meaningful learning situations on the ward” and item “The learning situations were multi-dimensional in terms of content”) were merged together for a better understanding (Table 4).

Item	Original CLES+T	Iranian version
7	There were sufficient meaningful Learning situations on the ward.	There were sufficient and multi-dimensional Learning situations on the ward.
8	The learning situations were multi-Dimensional in terms of content.	

Table 4: Semantic analysis

Reliability

For the reliability, a sample of 35 students studying at nursing universities in February 2019 were selected. Data were put in SPSS to calculate the Cronbach's alpha for each episode separately (see Table 5).

Constructs	Items	Cronbach's alpha
Learning environment atmosphere	8	0.739
Leadership style of the ward manager	4	0.781
Premises of nursing on the ward	4	0.704
Supervisory relationship	8	0.890
Students mentor an enabling the integration of theory and practice	3	0.846
Cooperation between clinical placement and the students' mentor	3	0.866
Relationship between students, mentor and clinical placement	3	0.865

Table 5: Reliability of CLES+T scale in Iranian version

The overall Cronbach's alpha of the 33 items was 0.813 and ranged between 0.704 and 0.890 for all factors identified in the theoretical structure of CLES+T. The highest Cronbach's alpha was found in the subcategory "supervisory relationship" with a value of 0.89.

4.3 Results for the objective: To validate the Clinical Learning Environment, Supervision and Nurse Teacher (CLEST) questionnaire among Iranian undergraduate nursing students.

The results of the translation and cultural adaptation process of the CLES + T scale to measure the perception of Iranian nursing students about the clinical learning environment are shown above in the second objective. Other evidence of the validity and reliability of the scale is provided which completes the results on the psychometric properties presented by the adapted scale, which we calculated in the third main objective and are shown below.

Other psychometric properties of the CLES + T scale adapted to Iranian

From the final adapted version and the content validity analyzed based on the experts' judgment, more evidence is provided about the validity of the instrument, such as the construct validity and the reliability of the adapted version of the CLES + T scale to the Iranian estimates from the sample described.

Overall respond rate

The number of participants in this study was 325 nursing students and 100% responded the questionnaire after reading the students' awareness.

Characterization of the participating sample

A descriptive analysis was carried out through means, standard deviations and frequencies to describe the study sample (Table 6).

52.30% (n = 170) were women and 47.70% (n = 155) men. The ages ranged between 19 and 46 years with a mean of 23 years (SD: 2.69; 95% CI: 22.87-23.45). They were mostly single (89.2%) and lived with their parents (45.2%). They were studying between the fourth and sixth semester (68.62%), they had

no previous nursing experience before university (88.0%), and the latest students internship wards were; the Internal, ICU-CCU and the Surgery unit (24.3%, 20.3% and 19.7% respectively). The duration of the training was 3 or 4 weeks (52.9% and 21.8% respectively). And the level of training satisfaction was medium or high (64.0%).

	Category	N	%
Gender	Male	155	47.7
	Female	170	52.3
Marital status	Single	290	89.2
	Married	35	10.8
Living place	With parents	147	45.2
	Student hostel	104	32.0
	Renting home	74	
Nursing history before university	Yes	39	12.0
	No	286	88.0
Semester	Third semester	25	7.7
	<i>Four semester</i>	91	28.0
	<i>Fifth semester</i>	61	18.8
	<i>Sixth semester</i>	71	21.8
	<i>Seven semester</i>	26	8.0
	<i>Eighth semester</i>	51	15.7
	<i>Maternity</i>	33	10.2
	<i>Surgery</i>	64	19.7
	<i>Internal</i>	79	24.3
	<i>ICU-CCU</i>	66	20.3

Ward	<i>Psychology</i>	10	3.1			
	<i>Emergency</i>	15	4.6			
	<i>Pediatrics</i>	31	9.5			
	<i>Neurology</i>	18	5.5			
	<i>Heart</i>	1	0.3			
	<i>Operating Room</i>	8	2.5			
Level of training satisfaction	Very low	4	1.2			
	Low	28	8.6			
	Medium	85	26.2			
	High	125	38.5			
	Very high	83	25.5			
Length of last training	One week	9	2.8			
	Two week	51	15.7			
	Three week	172	52.9			
	Four week	71	21.8			
	Five week	22	6.8			
		Half	Median	Standard deviation	Minimum	Maximum
Age	23.16	23.00	2.69	19	46	

Table 6. Sample characteristics (N=325)

Descriptive analysis of the Iranian scale

Table 7 presents the distribution of the scores in the different response categories of the items that make up the scale according to the dimension or domain to which it belongs according to the original version of the scale:

- Pedagogical atmosphere (Space 1-8)
- Leadership style of the ward manager (Manage 1-4)
- Nursing care on the ward (Nursing 1-4)
- The content of supervisory relationship (Relation 1-8)
- Role of the nurse teacher (Teacher 1-3; Teacher Nurse 1-3; Teacher Student 1-3)

It is observed how the frequency of non-response was 0 for all the items. The 33 items on the scale had 100% of the possible values.

From the scores provided in the items, it is also observed that, in relation to the learning environment, these oscillate between 49.5% and 66.2% for the categories in agreement or in complete agreement. Between 15.4% and 40.9% in those who disagree or completely agree. Scores in the neither agree nor disagree category between 11.7% and 21.9%.

Between 44.0% and 46.7% agree or strongly agree with the leadership style of the unit supervisor. Between 28.9% and 36.9% are not, and between 19.1% and 24.3 do not agree or disagree. They score between 52.9% and 70.5% as agreeing or strongly agreeing with the nursing care in the Unit. Between 12.6% and 28.9% disagree or strongly disagree, and between 15.7% and 28.3% do not agree or disagree.

Regarding the content of the supervision relationship, from 49.5% to 65.5% have valued the items as agree or strongly agree. Between 15.4% and 27.7% have done it as disagreeing or strongly disagree. From 14.5% to 22.8% as neither agree nor disagree.

Regarding the role of the teaching nurse, scores were observed in the items that ranged between 47.4% and 68.6% in the categories of agreement or completely agree. Between 15.7% and 24.9% in those who disagree or completely disagree, and between 12.6% and 27.7% in those who neither agree nor disagree.

Dimension	Item	Frequency (percentage)				
		Completely not agree	Nearly not agree	No Idea	Nearly agree	Completely agree
Pedagogical atmosphere	Space 1: The staffs were easy to approach	61(18. 8%)	50(15. 4%)	38(11. 7%)	110(33. 8%)	66(20. 3%)
	Space 2: I felt comfortable going to the ward at the start of my shift	17(5. 2%)	42(12.9%)	51(15. 7%)	122(37. 5%)	93(28. 6%)
	Space 3: During staff meetings (e.g. before shifts) I felt comfortable taking part in the discussion	40(12. 3%)	53(16. 3%)	71(21. 8%)	102(31. 4%)	59(18. 2%)
	Space 4: There was a positive atmosphere on the ward 5	22(6. 8%)	67(20. 6%)	67(20. 6%)	112(34. 5%)	57(17. 5%)
	Space 5: The staffs were generally interested in student supervision	23(7. 1%)	72(22. 2%)	61(18. 8%)	106(32. 6%)	63(19. 4%)
	Space 6: The staff learned to know the students by their personal names	79(24. 3%)	54(16. 6%)	43(13. 2%)	98(30. 2%)	51(15. 7%)
	Space 7: There were sufficient meaningful learning situations on the ward	27(8. 3%)	47(14. 5%)	62(19. 1%)	126(38. 8%)	63(19. 4%)
	Space 8: The learning situations were multidimensional in terms of content + The ward can be regarded as a good learning environment	8(2. 5%)	42(12. 9%)	59(18. 2%)	147(45. 2%)	69(21. 2%)
Leadership style of the ward manager (WW)	Manage_1: The WM regarded the staff on her/his ward as key resource	41(12. 5%)	53(16. 3%)	79(24. 3%)	113(34. 8%)	39(12. 0%)
	Manage_2: The WM was a team member	34(10. 5%)	74(22. 8%)	66(20. 3%)	119(36. 6%)	32(9. 8%)
	Manage_3: Feedback from the WM could easily be considered a learning situation	41(12. 6%)	60(18. 5%)	72(22. 2%)	112(34. 5%)	40(12. 3%)
	Manage_4: The effort of individual employees was appreciated	51(15. 7%)	69(21. 2%)	62(19. 1%)	94(28. 9%)	49(15. 1%)
Nursing care on the Ward	Nursing_1: The ward's nursing philosophy was clearly define	32(9. 8%)	62(19. 1%)	51(15. 7%)	120(36. 9%)	60(18. 5%)
	Nursing_2: Patients received individual nursing care	9(2. 8%)	52(16. 0%)	92(28. 3%)	117(36. 0%)	55(16. 9%)
	Nursing_3: There were no problems in the information flow related patients to care	13(4. 0%)	44(13. 5%)	73(22. 5%)	134(41. 2%)	61(18. 8%)
	Nursing_4: Documentation of nursing (e.g. nursing plans, daily recording of nursing procedures, etc.) was clear	10(3. 1%)	31(9. 5%)	55(16. 9%)	136(41. 8%)	93(28. 6%)
The content of supervisory relationship	Relation_1: My supervisor showed a positive attitude towards supervision	21(6. 5%)	67(20. 6%)	73(22. 5%)	108(33. 2%)	56(17. 2%)
	Relation_2: I felt that I received individual supervision	27(8. 3%)	63(19. 4%)	74(22. 8%)	127(39. 1%)	34(10. 5%)
	Relation_3: I continuously received feedback from my supervisor	11(3. 4%)	47(14. 5%)	54(16. 6%)	157(48. 3%)	56(17. 2%)
	Relation_4: Overall I am satisfied with the supervision I received	12(3. 7%)	38(11. 7%)	74(22. 8%)	141(43. 4%)	60(18. 5%)
	Relation_5: The supervision was based on a relationship of equality and promoted my learning	18(5. 5%)	56(17. 2%)	55(16. 9%)	121(37. 2%)	75(23. 1%)
	Relation_6: There was a mutual interaction in the supervisory relationship	17(5. 2%)	47(14. 5%)	53(16. 3%)	135(41. 5%)	73(22. 5%)
	Relation_7: Mutual respect and approval prevailed in the supervisory relationship	22(6. 8%)	50(15. 4%)	47(14. 5%)	130(40. 0%)	76(23. 4%)
	Relation_8: The supervisory relationship was characterized by a sense of trust	24(7. 4%)	47(14. 5%)	67(19. 7%)	112(34. 5%)	78(24. 0%)
Teacher_1: In my opinion, the NT was capable to integrate theoretical knowledge and everyday practice of nursing	11(3. 4%)	44(13. 5%)	56(17. 2%)	147(45. 2%)	67(20. 6%)	

Role of the nurse teacher	Teacher_2: The NT was capable of operationalize the learning goals of this clinical placement	6(1. 8%)	45(13. 8%)	62(19. 1%)	151(46. 5%)	61(18. 8%)
	Teacher_3: The NT helped me to reduce the theory-practice gap	14(4. 3%)	50(15. 4%)	54(16. 6%)	133(40. 9%)	74(22. 8%)
	Teacher_N1: The NT was like a member of the nursing team	19(5. 8%)	42(12. 9%)	41(12. 6%)	133(40. 9%)	90(27. 7%)
	Teacher_N2: The NT was capable to give his or her pedagogical expertize to the clinical team	5(1. 5%)	40(12. 3%)	58(17. 8%)	139(42. 8%)	83(25. 5%)
	Teacher_N3: The NT and the clinical team worked together supporting my learning	15(4. 6%)	40(12. 3%)	60(18. 5%)	126(38. 8%)	84(25. 8%)
	Teacher_S1: The common meetings between myself, mentor and NT were comfortable experience	28(8. 6%)	53(16. 3%)	90(27. 7%)	98(30. 2%)	56(17. 2%)
	Teacher_S2: Climate of the meetings was congenial /In our common meetings I felt that we are the colleagues	23(7. 1%)	44(13. 5%)	83(25. 5%)	111(34. 2%)	64(19. 7%)
	Teacher_S3: Focus on the meetings was in my learning needs	22(6. 8%)	41(12. 6%)	77(23. 7%)	115(35. 4%)	70(21. 5%)

Table 7. Distribution of scores on the scale items (n = 325)

In the Persian version of CLES+T the supervisory relationship refers guiding, supporting and assessing of student nurses but the occupational title of supervision is different in different countries even in different universities in the one country. Supervision can accrue as individual supervision or group supervision. In the Iranian university the term of Nazer used for supervisor. 14.5% of students supervised by nurse, 0.3% of students had nurse specialist as a supervisor, 0.3% supervised by assistant ward manager, 1.2% supervised by ward manager and 83.7% supervised by other. During the internship 2.8% of students didn't have any supervisor. 0.3% of students didn't have any relationship with the supervisor. 8. 6% of students, changed their supervisor without being planned. 10.2% of students had varies supervisors by varies shifts or workplaces. 69.5 of students had the same supervisor and, 8.6% of students had personal supervisor.

19.1% of our sample did not have meeting with supervisor during internship, 16.6% had meeting once or twice during the course, 9.8% less than once a week, 39.1% about once a week and 15.4% more often.

Nazer_1	Frequency	Percentage
Nurse	47	14.5
Nurse specialist	1	0.3
Assistant ward manager	1	0.3
Ward manager	4	1.2
Other	272	83.7
Total	325	100.0
Nazer_2	Frequency	Percentage
Without supervisor	9	2.8
The relationship with the supervisor did not work	1	0.3
Change of supervisor without being planned	28	8.6
Supervisor varies by shift or workplace	33	10.2
The same supervisor had several students	226	69.5
A personal supervisor was appointed and our relationship worked	28	8.6
Total	325	100.0
Nazer_3	Frequency	Percentage
Not at all	62	19.1
Once or twice during the course	54	16.6
Less than once a week	32	9.8
About once a week	127	39.1
More often	50	15.4
Total	325	100.0

Table 8. The summary of supervision (n=325)

The descriptive statistics of mean, median, standard deviation, skewness and kurtosis for each item are shown in Table 9.

Item	Mean	Median	Standard deviation	Minimum	Maximum	Asymmetry	Kurtosis
Space_1	3.22	4.00	1.420	1	5	-0.353	-1.255
Space_2	3.71	4.00	1.163	1	5	-0.728	-0.361
Space_3	3.27	3.00	1.276	1	5	-0.342	-0.947
Space_4	3.35	4.00	1.184	1	5	-0.321	-0.886
Space_5	3.35	4.00	1.220	1	5	-0.286	-0.999
Space_6	2.96	3.00	1.440	1	5	-0.110	-1.410
Space_7	3.46	4.00	1.195	1	5	-0.565	-0.600
Space_8	3.70	4.00	1.022	1	5	-0.660	-0.184
Manage_1	3.17	3.00	1.213	1	5	-0.355	-0.844
Manage_2	3.13	3.00	1.181	1	5	-0.269	-0.962
Manage_3	3.15	3.00	1.228	1	5	-0.306	-0.937
Manage_4	3.06	3.00	1.317	1	5	-0.136	-1.171
Nursing_1	3.35	4.00	1.255	1	5	-0.423	-0.935
Nursing_2	3.48	4.00	1.038	1	5	-0.304	-0.596
Nursing_3	3.57	4.00	1.065	1	5	-0.560	-0.331
Nursing_4	3.83	4.00	1.044	1	5	-0.826	0.135
Relation_1	3.34	4.00	1.172	1	5	-0.285	-0.873
Relation_2	3.24	3.00	1.132	1	5	-0.393	-0.736
Relation_3	3.62	4.00	1.038	1	5	-0.694	-0.177
Relation_4	3.61	4.00	1.032	1	5	-0.626	-0.114
Relation_5	3.55	4.00	1.179	1	5	-0.526	-0.707
Relation_6	3.62	4.00	1.137	1	5	-0.661	-0.406
Relation_7	3.58	4.00	1.196	1	5	-0.645	-0.563
Relation_8	3.53	4.00	1.211	1	5	-0.543	-0.660
Teacher_1	3.66	4.00	1.055	1	5	-0.685	-0.200
Teacher_2	3.66	4.00	0.994	1	5	-0.595	-0.277
Teacher_3	3.62	4.00	1.122	1	5	-0.617	-0.476
Teacher_N1	3.72	4.00	1.171	1	5	-0.805	-0.255
Teacher_N2	3.78	4.00	1.011	1	5	-0.641	-0.286
Teacher_N3	3.69	4.00	1.122	1	5	-0.685	-0.301
Teacher_S1	3.31	3.00	1.186	1	5	-0.308	-0.748
Teacher_S2	3.46	4.00	1.158	1	5	-0.468	-0.558
Teacher_S3	3.52	4.00	1.159	1	5	-0.541	-0.488

Table 9. Descriptive statistics of the items

It is observed how the highest means correspond to the items that belong to the dimensions “Nursing care on the Ward” and “Role of the nurse teacher”. In particular, the items Nursing_4 (Documentation of nursing (eg nursing plans, daily recording of nursing procedures, etc.) was clear) and Teacher_N2 (The NT was capable of operationalize the learning goals of this clinical placement) are the ones with the highest value (3.8 respectively). On the other hand, the

dimension “Leadership style of the ward manager (WW)” is the one with the lowest average, with the items Manage_2 (The WM was a team member) and Manage_4 (The effort of individual employees was appreciated) the ones with the lowest score (3.1 respectively). When examining to what extent the frequency distribution of the items deviated or not from the normal distribution, no difficulties were observed to consider regarding the normality of the items. Regarding asymmetry, the deviations were less than the critical value of ± 1.96 . Neither deviations were detected regarding the pointing of the items (kurtosis) above these values. In the 325 valid data, when applying the Skewness-Kurtosis statistic of normality (with Lilliefors significance correction), all items presented $p < 0.001$.

Construct validity

Underlying structure from exploratory factor analysis

The sampling adequacy of the observations to the exploratory factor analysis technique was good. It was verified from the Bartlett's sphericity test ($p < 0.001$) that the correlation coefficients of the correlation matrix were different from 0. On the other hand, the correlation matrix of the factor analysis showed a low determinant ($1,29E-006$), which means that there are variables with high correlations and these data also allow us to verify that a factor analysis is appropriate. Likewise, the degree of the joint relationship between the variables from the Kaiser-Meyer-Olkin coefficient was good (0.82). The results of the corrected total item correlation (Table 10) suggest from the outset the non-consideration of the items Space_2 (I felt comfortable going to the ward at the start of the shift), Space_6 (The staff learned to know the students by their personal names), Nursing_4 (Documentation of nursing (eg nursing plans, daily recording of nursing procedures, etc.) was clear) and Teacher_S1 (The common meetings between myself, mentor and NT were comfortable experience). According to the most common practice, those items whose correlations are greater than or equal to 0.30 are retained. However, given that the item-total correlation is neither negative nor with a value lower than 0.20 and, the alpha of the global scale (0.87) would not improve if these items were eliminated, they decided to keep and see how their behavior is throughout the different evaluations they carry out.

	Mean	Typical deviation	Corrected item-total correlation	Cronbach's alpha if item is removed
Space_1	3.22	1.42	0.30	0.87
Space_2	3.71	1.16	0.23*	0.87
Space_3	3.27	1.28	0.40	0.87
Space_4	3.35	1.18	0.40	0.87
Space_5	3.35	1.22	0.48	0.87
Space_6	2.96	1.44	0.29*	0.87
Space_7	3.46	1.20	0.49	0.87
Space_8	3.70	1.02	0.36	0.87
Manage_1	3.17	1.21	0.36	0.87
Manage_2	3.13	1.18	0.30	0.87
Manage_3	3.15	1.23	0.39	0.87
Manage_4	3.06	1.32	0.37	0.87
Nursing_1	3.35	1.25	0.33	0.87
Nursing_2	3.48	1.04	0.33	0.87
Nursing_3	3.57	1.07	0.36	0.87
Nursing_4	3.83	1.04	0.23*	0.87
Relation_1	3.34	1.17	0.38	0.87
Relation_2	3.24	1.13	0.43	0.87
Relation_3	3.62	1.04	0.38	0.87
Relation_4	3.61	1.03	0.54	0.87
Relation_5	3.55	1.18	0.50	0.87
Relation_6	3.62	1.14	0.48	0.87
Relation_7	3.58	1.20	0.46	0.87
Relation_8	3.53	1.21	0.45	0.87
Teacher_1	3.66	1.06	0.38	0.87
Teacher_2	3.66	0.99	0.45	0.87
Teacher_3	3.62	1.12	0.48	0.87
Teacher_S1	3.72	1.17	0.23*	0.87
Teacher_S2	3.78	1.01	0.37	0.87
Teacher_S3	3.69	1.12	0.32	0.87
Teacher_N1	3.31	1.19	0.50	0.87
Teacher_N2	3.46	1.16	0.50	0.87
Teacher_N3	3.52	1.16	0.48	0.87

Table 10. Descriptive statistics and item-total correlation of each item

Note * Items with corrected item-total correlation <0.30

Underlying structure from exploratory factor analysis forcing 5 factors

The results showed that the first factor explains 21.10% of the variance, factor 2 explained 10.66%; factor 3 explained 7.03%; factor 4 explained 5.19% and factor 5 explained 5.19% of the variance.

The 5-factor model represents 49.77% of the original variability and the distribution of the items in some factors is different from the theoretical structure of the original version of the scale.

As can be seen in Table 11, factor 1 included the items from the domain “The content of supervisory relationship” and although the item Relation_1 (My supervisor showed a positive attitude towards supervision) also had representation in this factor, its greatest influence was given in factor 5. The items Teacher_S1 (The common meetings between myself, mentor and NT were comfortable experience), Teacher_S2 (Climate of the meetings was congenial, In our common meetings I felt that we are the colleagues) and Teacher_S3 (Focus on the meetings was in my learning needs) of the domain “Role of the nurse teacher” have high factor loadings in factor 1 and to a lesser extent in factor 3.

Factor 2 included 5 of the 8 items from the domain “Pedagogical atmosphere”. In this factor, the items of the domain “Nursing care on the Ward” were also included. Item Space_3 (During staff meetings (e.g. before shifts) I felt comfortable taking part in the discussion, from the domain “Pedagogical atmosphere”, had a factorial load to a lesser extent for factor 3 and item Space_4 (There was a positive atmosphere on the ward 5) for factor 5.

In factor 3, the items of the domain “Leadership style of the ward manager (WM)” had a high factor load.

Factor 4 included the other 6 items (Teacher_1-Teacher_3 and Teacher_N1-Teacher_N3) of the domain “Role of the nurse teacher” not included in factor 1.

In factor 5, the high factorial loads were from the items Space_1 (The staffs were easy to approach), Space_2 (I felt comfortable going to the ward at the start of my shift) and Space_8 (The learning situations were multidimensional in terms of content + The ward can be regarded as a good learning environment) that represent part of the “Pedagogical atmosphere” domain.

	Factors					
	F1	F2	F3	F4	F5	Communality
Space_1					0.734	0.610
Space_2					0.628	0.422
Space_3		0.510	0.389			0.482
Space_4		0.496			0,335	0.432
Space_5		0.545				0.504
Space_6		0.616				0.578
Space_7		0.511				0.405
Space_8					0.370	0.270
Manage_1			0.675			0.509
Manage_2			0.775			0.624
Manage_3			0.741			0.596
Manage_4			0.668			0.491
Nursing_1		0.622				0.455
Nursing_2		0.721				0.582
Nursing_3		0.726				0.547
Nursing_4		0.456				0.298
Relation_1	0.423				0.513	0.486
Relation_2	0.593					0.413
Relation_3	0.670					0.484
Relation_4	0.701					0.547
Relation_5	0.711					0.570
Relation_6	0.718					0.562
Relation_7	0.714					0.557
Relation_8	0.676					0.515
Teacher_1				0.554		0.444
Teacher_2				0.674		0.548
Teacher_3				0.612		0.499
Teacher_N1				0.634		0.422
Teacher_N2				0.660		0.483
Teacher_N3				0.632		0.504
Teacher_S1	0.456		0.441			0.488
Teacher_S2	0.504		0.403			0.573
Teacher_S3	0.525		0.334			0.525

Table 11. Saturation of the items in each factor in the EFA (5 factors, n = 325)

Regarding how the items represented in this space of 5 retained dimensions have been; 3 variables presented a communality greater than or equal to 0.60; 15 variables presented communalities between 0.50 and 0.59; 13 variables presented communalities between 0.40 and 0.49; 2 variables presented communalities between 0.27 and 0.39. The minimum value was 0.27 and the maximum 0.62.

Underlying structure from exploratory factor analysis forcing 8 factors

The results showed that the sixth factor explained 4.88% of the variance, factor 7 explained 4.23% and factor 8 explained 3.32% of the variance. The 8-factor model represents 62.19% of the original variability. Although it partially improves the redistribution of the items in the different factors or dimensions, the complexity of some of them continues to be observed when helping to determine a single factor. Likewise, there is still some item that is mixed with others that clearly determine a very specific domain with which it does not seem to be related. Therefore, some difficulty continues to appear when interpreting any of the factors Table 12 shows the saturations of the items according to the exploratory factor analysis of 8 factors.

It is observed that factor 1 included 5 of the 8 items of the dimension "The content of supervisory relationship" and although the items Relation_2 (I felt that I received individual supervision) and Relation_3 (I continuously received feedback from my supervisor) also had representation in this factor, its greatest influence was given in factor 8. Factor 2 included the items from the domain "Nursing care on the Ward" and the items Space_6 (The staff learned to know the students by their personal names) and Space_7 (There were sufficient meaningful learning situations on the ward) from the factor "Pedagogical atmosphere" Which also saturated, although to a lesser extent, by factor 3. In factor 3, 6 of the 8 items in the "Pedagogical atmosphere" domain had a high factor load, and although items Space_6 (The staff learned to know the students by their personal names) and Space_7 (There were sufficient meaningful learning situations on the ward). As mentioned, they had

a greater representation in factor 2, they were also represented in this factor 3. Factor 4 included the items from the domain “Leadership style of the ward manager (wm)”. Factor 5 included the items Teacher_S1 (The common meetings between myself, mentor and NT were comfortable experience), Teacher_S2 (Climate of the meetings was congenial / in our common meetings I felt that we are the colleagues) and Teacher_S3 (Focus on the meetings was in my learning needs) of the domain “Role of nurse teacher”. In factor 6, the items Teacher_1 (In my opinion, the NT was capable to integrate theoretical knowledge and everyday practice of nursing), Teacher_2 (The NT was capable of operationalize the learning goals of this clinical placement) and Teacher_3 (The NT helped me to reduce the theory-practice gap) of the domain “Role of nurse teacher”.

Factor 7 included the items Teacher_N1 (The NT was like a member of the nursing team), Teacher_N2 (The NT was capable to give his or her pedagogical expertise to the clinical team) and Teacher_N3 (The NT and the clinical team worked together supporting my learning) of the domain “Role of nurse teacher”. In factor 8, the items Relation_1 (My supervisor showed a positive attitude towards supervision), Relation_2 (I felt that I received individual supervision) and Relation_3 (I continuously received feedback from my supervisor) from the domain “The content of supervisory relationship” and the item Space_8 (The learning situations were multidimensional in terms of content + The ward can be regarded as a good learning environment) of the domain “Pedagogical atmosphere”.

In this 8-dimensional retained space, there is a considerable increase in how the 33 items have been represented; 24 variables presented a communality greater than or equal to 0.60; 6 variables presented communalities between 0.50 and 0.59; 3 variables presented communalities between 0.40 and 0.49; 0 variables presented communalities between 0.27 and 0.39. The minimum value was now 0.40 and the maximum 0.75. In this case, the underlying structure literally reproduces the dimensions “Leadership style of the ward manager (WW)” and “Nursing care on the Ward”. Likewise, the dimension “Role of the nurse teacher” is clearly divided into three factors; “Relationship among student, mentor and nurse teacher”, “Nurse teacher as enabling the

integration of theory and practice" and, "Cooperation between placement staff and nurse teacher". In the dimensions "Pedagogical atmosphere", "Leadership style of the ward manager (WW)" and "The content of supervisory relationship" interpretability difficulties are still observed.

	Factors								Communality
	F1	F2	F3	F4	F5	F6	F7	F8	
Space_1			0.759						0.685
Space_2			0.709						0.604
Space_3			0.567		0.366				0.564
Space_4			0.666						0.544
Space_5			0.611						0.572
Space_6		0.439	0.376						0.585
Space_7		0.382	0.368						0.422
Space_8								0.493	0.401
Manage_1				0.744					0.597
Manage_2				0.808					0.692
Manage_3				0.812					0.699
Manage_4				0.687					0.535
Nursing_1		0.637							0.503
Nursing_2		0.798							0.694
Nursing_3		0.779							0.635
Nursing_4		0.606							0.467
Relation_1								0.774	0.701
Relation_2	0.323							0.666	0.602
Relation_3	0.462							0.627	0.627
Relation_4	0.621							0.390	0.598
Relation_5	0.682								0.597
Relation_6	0.801								0.699
Relation_7	0.745								0.664
Relation_8	0.769								0.662
Teacher_1						0.779			0.697
Teacher_2						0.762			0.726
Teacher_3						0.662			0.622
Teacher_N1							0.792		0.672
Teacher_N2							0.789		0.712
Teacher_N3							0.783		0.719
Teacher_S1					0.701				0.631
Teacher_S2					0.819				0.750
Teacher_S3					0.726				0.645

Table 12. Saturation of the items in each factor in the EFA (8 factors, n = 325)

Underlying structure from exploratory factor analysis with 9 factors

The ninth factor explains 3.15% of the variance, the model with the 9 factors representing 65.35% of the original variability. As can be seen in Table 13, factor 1 included 5 of the items from the domain "The content of supervisory relationship" and although the items Relation_2 (I felt that I received individual supervision) and Relation_3 (I continuously received feedback from my supervisor) also were represented in this factor, their greatest influence was given in factor 7 together with the item Relation_1 (My supervisor showed a positive attitude towards supervision). Therefore, the dimension "The content of supervisory relationship" is finally divided into two sub dimensions: the one that groups the items Relationship_1 to Relation_3 on the one hand, and the one that groups the items Relation_4 to Relation_8.

The first refers to "attitudes in the relationship of supervision" and the second to "values in the relationship of supervision". In factor 2, 5 of the 8 items of the "Pedagogical atmosphere" domain had a high factor load. Items Space_1 (The staffs were easy to approach) and Space_2 (I felt comfortable going to the ward at the start of my shift) determined factor 9. Consequently, the dimension "Pedagogical atmosphere" is divided in two. The one made up of the items Space_3 to Space_8 and the one made up of the items Space_1 (The staffs were easy to approach) and Space_2 (I felt comfortable going to the ward at the start of my shift). The learning environment seems to distinguish between the learning environment at the beginning of the "beginning learning environment" practices and the learning environment once the first approaches to the clinical space of the "learning environment during the practices have been made. Factor 3 included the items from the domain "Leadership style of the ward manager (wm)" and factor 4 the items from the domain "Nursing care on the Ward". In factor 5, the items of the domain "Role of nurse teacher" corresponding to the factor "Nurse Teacher as enabling the integration of theory and practice" had a high factor load. Factor 6 included the items of the domain "Role of nurse teacher" corresponding to the factor "Relationship among student, mentor and nurse teacher".

In factor 7, its greatest contribution is made by the items Relation_1, Relation_2 and Relation_3 of the domain “The content of supervisory relationship” and the item Space_8 (The learning situations were multidimensional in terms of content + The ward can be regarded as a good learning environment).

Factor 8 included the items from the domain “Role of nurse teacher”. corresponding to the factor “Cooperation between placement staff and nurse teacher”.

In factor 9, the items Space_1 and Space_2 of the domain “Pedagogical atmosphere” had high factor loadings, which, as mentioned above, refer to the learning environment at the beginning of the practices.

	Factors									Communality
	F1	F2	F3	F4	F5	F6	F7	F8	F9	
Space_1									0.803	0.767
Space_2									0.812	0.713
Space_3		0.679								0.582
Space_4		0.726								0.624
Space_5		0.717								0.608
Space_6		0.713								0.645
Space_7		0.565								0.462
Space_8							0.483			0.404
Manage_1			0.748							0.613
Manage_2			0.803							0.692
Manage_3			0.809							0.699
Manage_4			0.679							0.543
Nursing_1				0.687						0.570
Nursing_2				0.747						0.700
Nursing_3				0.726						0.643
Nursing_4				0.714						0.576
Relation_1							0.760			0.705
Relation_2	0.302						0.687			0.634
Relation_3	0.449						0.640			0.630
Relation_4	0.608						0.407			0.603
Relation_5	0.672									0.598
Relation_6	0.802									0.711
Relation_7	0.738									0.665
Relation_8	0.772									0.678
Teacher_1					0.807					0.737

Teacher_2					0.783					0.750
Teacher_3					0.723					0.673
Teacher_N1								0.785		0.680
Teacher_N2								0.790		0.714
Teacher_N3								0.789		0.743
Teacher_S1					0.733					0.668
Teacher_S2					0.837					0.802
Teacher_S3					0.783					0.732

Table 13. Saturation of the items in each factor in the EFA (9 factors, n = 325)

In the space of these 9 dimensions; 25 variables presented a communality greater than 0.60; 6 variables presented communalities greater than 0.50 and less than 0.59 and 3 variables presented communalities between 0.40 and 0.49. The minimum value was now 0.40 and the maximum 0.80. The item that is worst represented is in the space of the 9 retained dimensions is Space_8 (0.40). Item that, in addition to not being well represented, interferes with the interpretation of factor 7.

In summary, the structure that is reproduced indicates that:

- The “Pedagogical atmosphere” dimension is divided into: "Learning environment at the beginning of the practices", "Learning environment during practices"
- The dimension "Role of nurse teacher" is divided into: "Nurse teacher as enabling the integration of theory and practice", "Relationship among student, mentor and nurse teacher", "Cooperation between placement staff and nurse teacher"
- The dimensions “Leadership style of the ward manager (wm)” and “Nursing care on the Ward” literally correspond to that of the original scale
- The dimension "The content of supervisory relationship" is divided into: "Attitudes in the supervisory relationship", "Values in the supervisory relationship".

Verification of the structure from confirmatory factor analysis

Subsequently, with the purpose of checking or verifying the internal structure of the adapted CLES + T, these four models were tested using confirmatory factor analysis (CFA). As a method of estimating the parameters, the maximum likelihood was used.

- Model 1: According to the theoretical construct of the original scale (5 factors)
- Model 2: According to the results of exploratory factor analysis, forcing 5 factors (Iranian adapted version)
- Model 3: According to the results of exploratory factor analysis, forcing 8 factors (Iranian adapted version)
- Model 4: According to the results of exploratory factor analysis, 9 factors (Iranian adapted version)

In Table 14, the comparative data of each adjusted confirmatory factor model are shown in a summarized way.

The likelihood ratio of the Chi-square has a $p < 0.05$ in all the models evaluated, which indicates that there are statistically significant differences between the compared covariance matrices (observed vs expected). This data indicates that the models and the data do not fit each other. However, since the Chi-square is susceptible to sample size, it is necessary to take into account other measures of goodness of fit.

MODELS	Absolute Fit Measures		Incremental Adjustment Measures			Parsimony Adjustment Measures			
	Chi-square	RMSEA	CFI	TLI	NFI	PRATIO	PCFI	PNFI	AIC
Model 1 (Theoretical)*	1560.92 (p<0.05)	0.08	0.72	0.70	0.65	0.92	0.66	0.59	1778.92
Model 2 (5 dimension)	1668.29 (p<0.05)	0.09	0.69	0.67	0.62	0.92	0.64	0.57	1886.29
Model 3 (8 dimension)	1096.47 (p<0.05)	0.06	0.84	0.82	0.75	0.88	0.74	0.66	1350.47
Model 4 (9 dimension)	899.24 (p<0.05)	0.05	0.89	0.87	0.80	0.87	0.77	0.69	1169.24

Table 14. Evaluation criteria of the models evaluated with the CFA

Note: Chi-square = Likelihood ratio; RMSEA = root mean square error of approximation; CFI = Comparative Adjustment Index; TLI = Tucker Lewis Index; NFI = normalized fit index; PRATIO = comparative fit level of parsimony and the normed fit index of parsimony; PCFI = Comparative Fit Index; PNFI = Index of normative adjustment; AIC = Akaike Information Criterion Index

The mean square error of approximation (RMSEA) is an absolute measure of the difference in the relationship structure between the proposed model and the covariance values in the study population. When the RMSEA is less than 0.10 it is considered a good fit between the measurement model and the data structure. If it is less than 0.05 the setting is considered higher and if the value is lower than

0.01, the setting is outstanding. In the case of the 4 models evaluated, all had an adjustment of less than 0.09, therefore, the measurement models of the questionnaire and the covariance structure of the responses of the study population have a good fit, the model being 4 the best of them (RMSEA = 0.05).

The incremental adjustment measures were also evaluated, being the Comparative Adjustment Index (CFI), an indicator that compares the covariance structure of the measurement model against a hypothetical situation where there is no relationship between the observed variables. When the CFI is greater than 0.90, it is considered that there is a reasonable fit between the model and the data. As the CFI approaches 1.00 the fit is better and becomes outstanding from 0.99. The CFI values in the 4 models were not higher than 0.90, however, model 4 had a close value (0.89), therefore, it could be said that the measurement model of the questionnaire and the structure of the data are close to a reasonable fit, but do not meet the acceptable minimum of 0.90.

Tucker Lewis Index (TLI), compares the adjustment by degrees of freedom of the proposed model and null (model of absence of relationship between variables). This index tends to 1 for models with a very good fit, with values greater than 0.90 being considered acceptable, although the ideal would be values greater than 0.95. The TLI values in the 4 models did not exceed 0.90, however, model 4 had a close value (0.87), therefore, it could be said that the model is close to a reasonable fit, but it does not achieve the acceptable minimum of 0.90. The normalized fit index (NFI) measures the proportional reduction as a function of fit when going from the null model to the proposed model (Bentler and Bonett, 1980). If it has values or greater than 0.90, it is considered that the model is appropriate. The NFI values in the 4 models did not exceed 0.90, therefore, it could be said that the models did not approach a reasonable fit.

Finally, the parsimony adjustment measures were evaluated, which stimulate the simplicity of the proposed model, relating the adjustment achieved with the number of free parameters of the model in question. In this case, the PRATIO was taken into account, which comprises the comparative adjustment level of parsimony and the adjusted index of parsimony. These indices are interpreted by comparing different proposed factorial models, in order to determine which one

presumes greater parsimony. The factorial model that has the highest indices will have greater parsimony. For this case, models 1 and 2 showed a value greater than 0.90. Another of the parsimony adjustment measures is the akaike information criterion index (AIC). In this case, the best fit will be the factorial model with the lowest indices, because the lower the value, the greater the parsimony of the model. The AIC value in model 4 was the lowest, so it could be said that the model is close to a reasonable fit. From the adjustment measures shown in the previous table, it was determined that model 4 is the most appropriate, given that its parsimony adjustment measures are the best compared to the other models and despite not having a value higher than 0.90 in the incremental adjustment measures, their values were the highest. These results reinforce the findings in the exploratory factor analysis. Figures 2, 3, 4 and 5 show the different models of the adapted CLES + T scale.

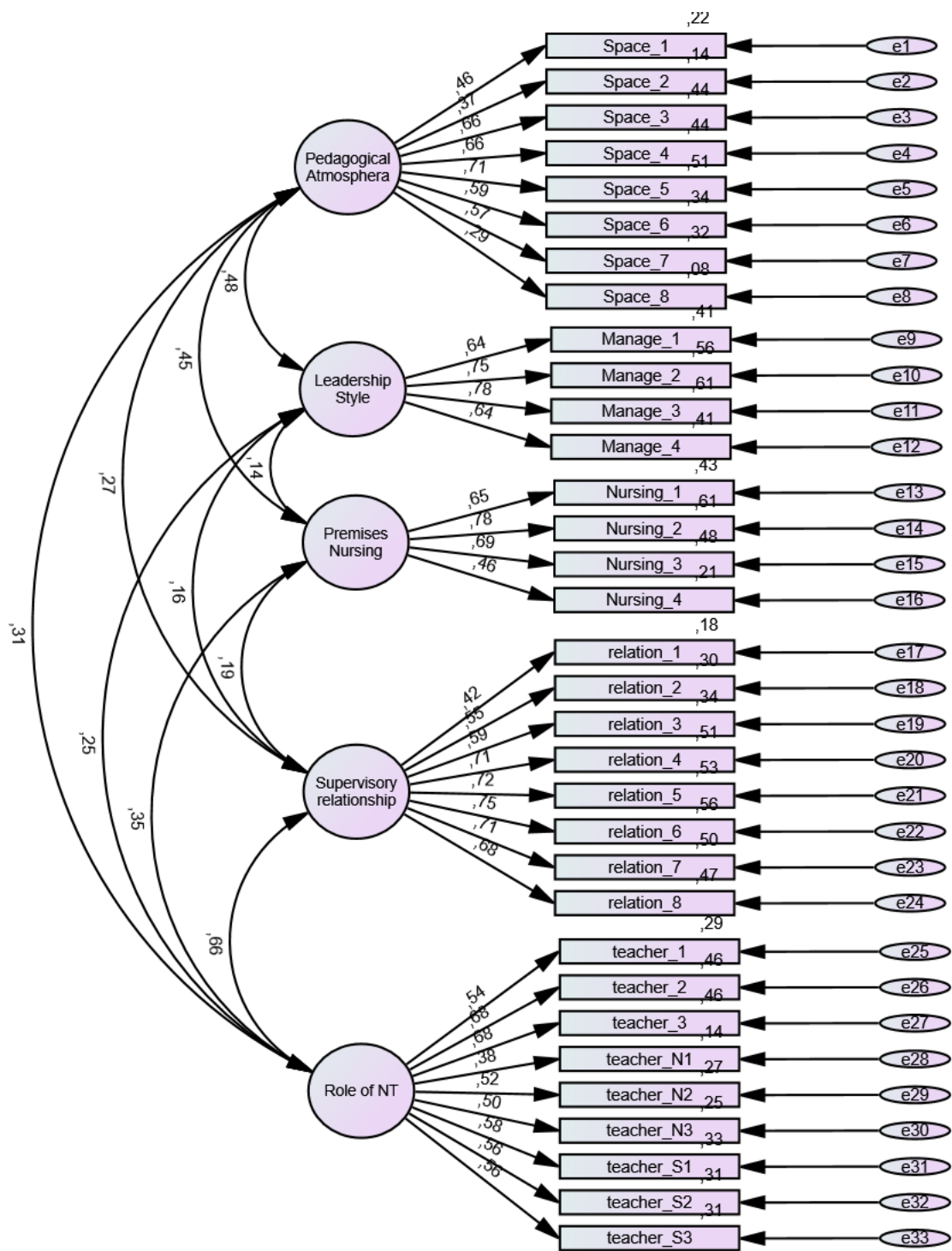


Figure 2. Structural model 1 of the CLES + T Scale (theoretical). Standardized weights and measurement errors of each of the items

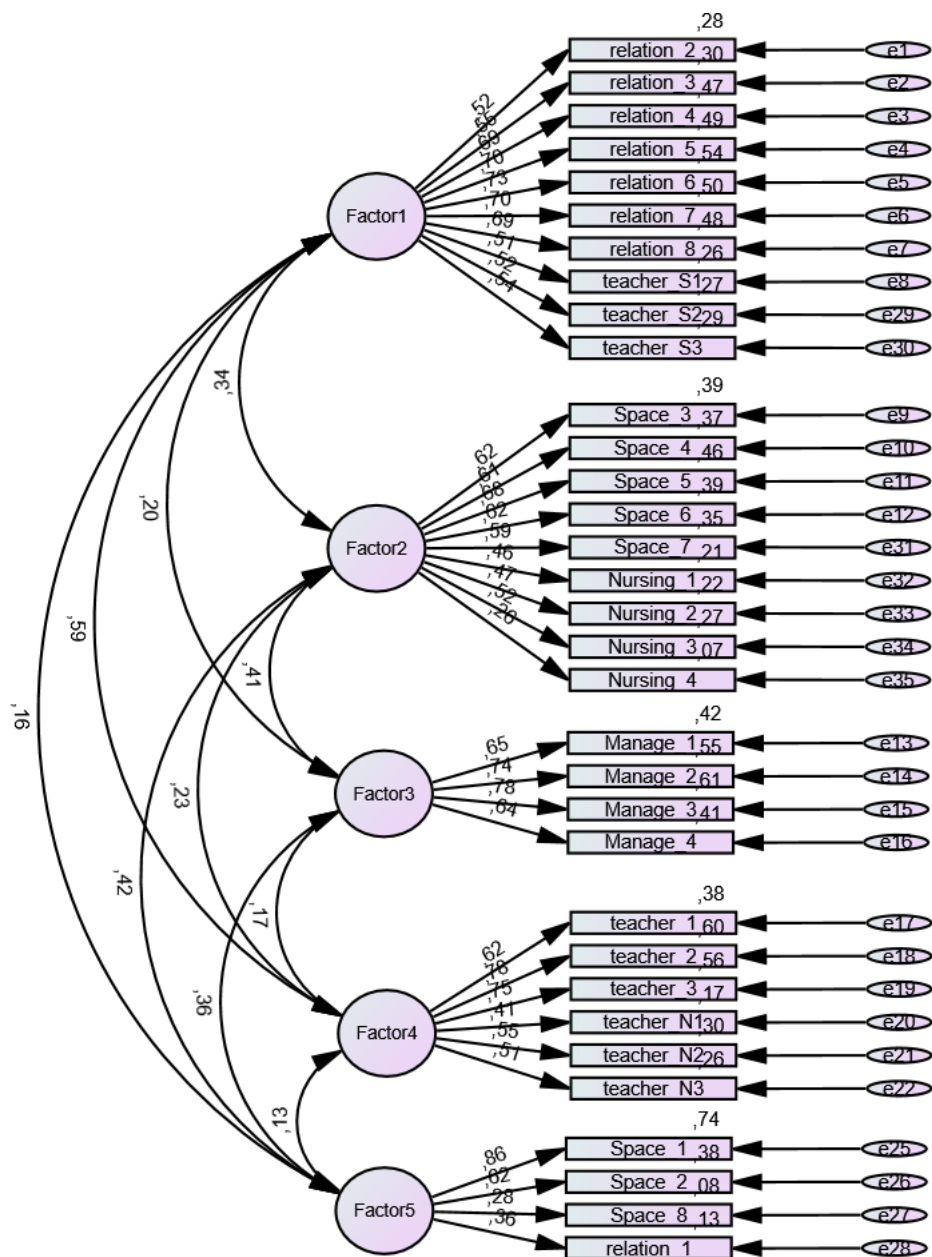


Figure 3. Structural model 2 of the CLES + T Scale (forcing 5 factors adapted version Iranian scale). Standardized weights and measurement errors of each of items

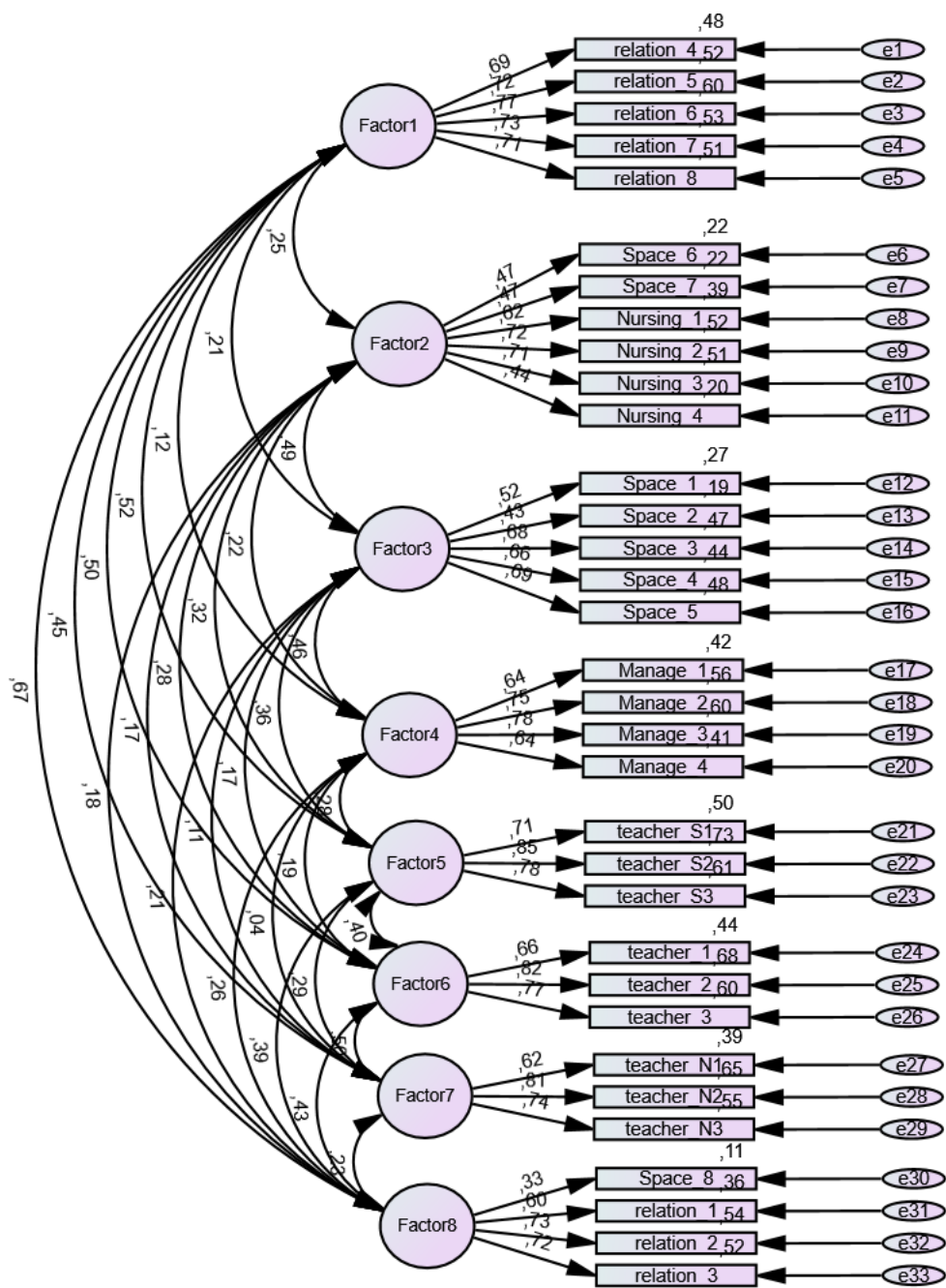


Figure 4. Structural model 3 of the CLES + T Scale (forcing 8 factors adapted version Iranian scale). Standardized weights and measurement errors of each of the items

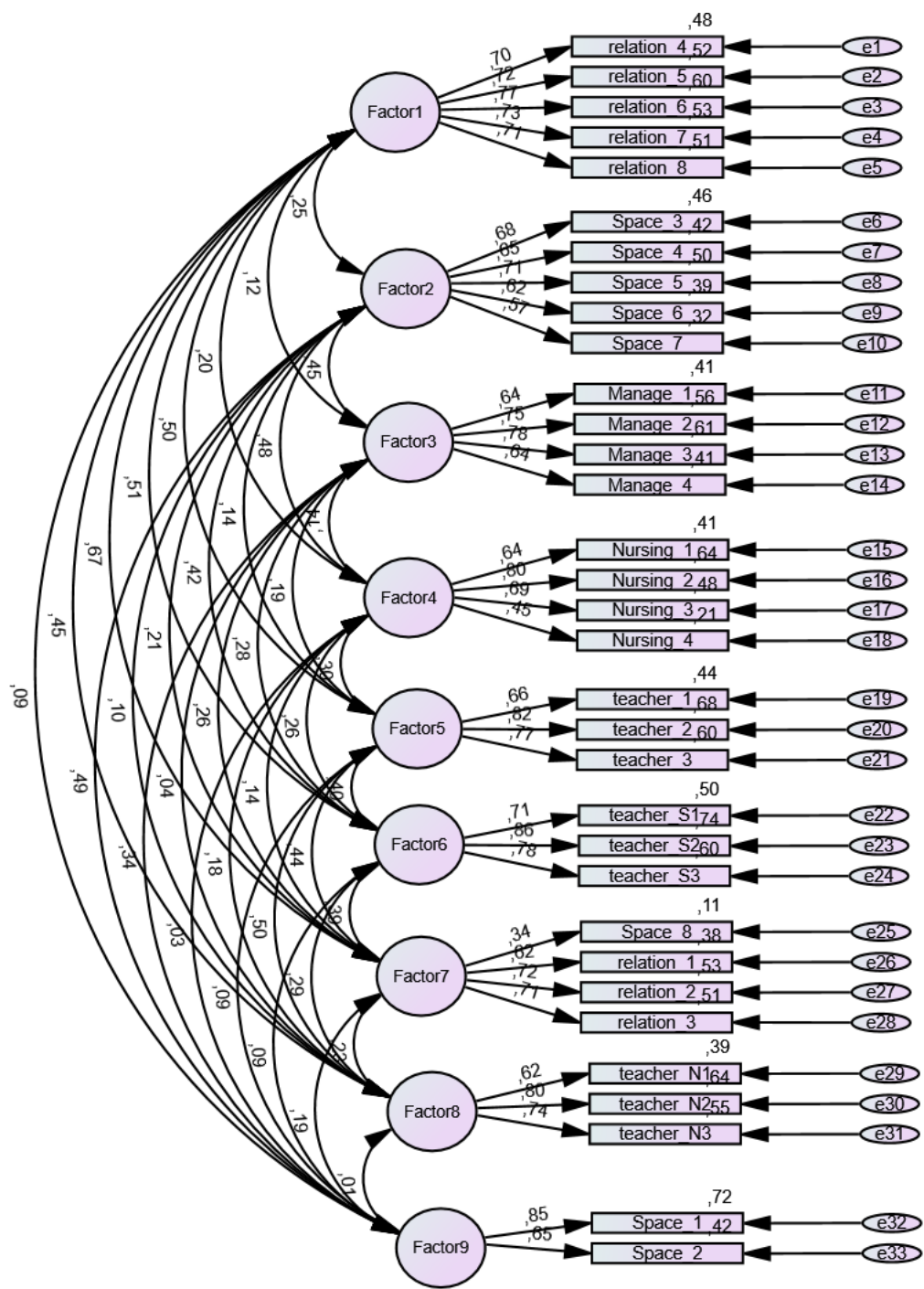


Figure 5. Structural model 4 of the CLES + T Scale (forcing 9 factors adapted version Iranian scale). Standardized weights and measurement errors of each of the items

Reliability

The internal consistency coefficients (Cronbach's alpha) for the global scores, as well as for the dimensions of the adapted CLES + T scale (Table 15) were 0.87 for the total scale and were between 0.69 and 0.85 for the dimensions of factors considered. With the exception of the dimension determined by the items Relation_1 to Relation_3 and Space_8, which presents questionable or doubtful reliability (Cronbach's $\alpha = .69$), for the rest of the dimensions the internal consistency is between acceptable and good.

Models	Items	Cronbach's alpha	Number of elements
Model 1: (Theoretical)	-	-	-
Pedagogical atmosphere	Space_1 to Space_8	0.77	8
Leadership style of the ward manager (WW)	Manage_1 to Manage_4	0.79	4
Nursing care on the Ward	Nursing_1 to Nursing_4	0.74	4
The content of supervisory relationship	Relation_1 to Relation_8	0.85	8
Role of the nurse teacher	Teacher_1 to Teacher_3 and Teacher_N1 to Teacher_N3 and Teacher_S1 to Teacher_S3	0.80	9
Model 4: (9 dimensions)	-	-	-
Pedagogical atmosphere	Space_1 to Space_2 Space_3 to Space_7	0.70 0.78	2 5
Leadership style of the ward manager (WW)	Manage_1 to Manage_4	0.79	4
Nursing care on the Ward	Nursing_1 to Nursing_4	0.74	4
The content of supervisory relationship	Relation_1 to Relation_3 and Space_8 Relation_4 to Relation_8	0.69 0.85	3 4
Role of the nurse teacher	Teacher_1 to Teacher_3 Teacher_N1 to Teacher_N3 Teacher_S1 to Teacher_S3	0.79 0.76 0.82	3 3 3
Total		0.87	33

Table 15. Internal consistency of the adapted CLES + T scale and its dimensions according to the theoretical model and with the best fit provided

5 *Discussion*

5.1 Discussion for the objective: To investigate and describe the clinical learning environment, supervision and attendant instructor scale in 10 countries.

Western European countries, after the Bologna declaration, promoted a greater harmonization in higher education, nursing students' mobility as well as variations in implementation (Gurková et al., 2016). Various Eastern European countries joined the European Union during the years 2004-2006. Many fields of life and science have since become more modernized in their thinking after following the admission to the EU. Nursing education has become a university degree in line with European education systems; although with various weaknesses in both theoretical and practical nursing still to be addressed (Antohe et al., 2016). In Asian countries, in contrast, the nursing program has been historically promoted and became a university-based diploma many years ago. In these developing countries, the nursing curriculum is divided to almost 50% theory learning and 50% practice for the 3 to 4-years duration of nursing studies (Mansutti et al., 2017).

The main finding of this study is that CLES+T is a valuable tool to evaluate satisfaction with clinical learning and identify key factors in clinical learning environment of student nurses in different countries from distinct geographical, social, and cultural areas. The most important factors across countries appear to be a good atmosphere in the clinical ward together with individualized and thorough supervision (Saarikoski et al., 2008). Clinical environment is a convened organism which consists of many integrated subsystems. Several evaluation scales have been used to assess nursing students' perception of their clinical placement. All studies indicated that the CLES+T instrument was successful and a reliable scale in the countries under discussion (Bergjan & Hertel, 2013; Warne et al., 2010). When students start the clinical practice, most of them are newcomers without previous practice background so they need optimal relief. This shows the importance of the supervisory relationship in the clinical environment (Nepal et al., 2016). The mean of supervisory relationship varies from a clinical supervisor, mentorship, and preceptorship with a positive attitude towards supervision and positive interaction with nursing students to improve their learning in nursing education (Chappel, 2016).

In Croatia, supervisors have 3 roles as a nurse teacher, mentor and supervisor, so with this multifunctional role they lack of the time to supervise the students. This results in a negative impact on clinical practice in Croatia (Lovric et al., 2016). There is a different model of supervision: group supervisory approaches and individualized supervisory approaches (Chappel, 2016).

According to previous studies and this review article, supervision is equally important in terms of quantity and quality. Individual supervision is more effective in the learning process than group supervision (Nepal et al., 2016). Based on our findings, the supervisory models are different among countries. In Norway, the majority of students are supervised individually (Henriksen et al., 2012); however, in Eastern European countries, group supervisory model is clearly more common; for example, in Romania and Hungary more than 83% of student nurses were supervised in groups (Antohe et al., 2016). In Lithuania, more than 41% of students were supervised individually by the staff ward (Murauskiene et al., 2013). In Germany and Belgium, the supervisory model is completely individual in every ward during the education (Bergjan & Hertel, 2013; Witte et al., 2011). Overall, the supervisory relationship was the strongest factor in clinical learning environment as it was confirmed in previous studies (Saarikoski et al., 2008; Warne et al., 2010).

The student satisfaction was estimated by using 3 items of CLES+T questionnaire: "Is the ward atmosphere regarded as a good learning environment?", "Are you satisfied with the supervision you have received?" and "How satisfied were you with the clinical placement as a whole?" (Watson et al., 2014). According to our findings, the highest satisfaction was achieved among students who had individualized supervisor relationship and most of the student nurses of this study were pleased with their clinical arrangement. This result is quite similar to what has been found in older EU countries (Warne et al., 2010). A small part of students in Eastern Europe had no supervisor during their clinical practice and they were the most unsatisfied students. This study showed that the students' satisfaction from the clinical learning environment in some specific countries in Asia (Nepal et al., 2016 & D'Souza et al., 2015) is similar to that

found in previous researches in Europe (Saarikoski et al., 2002; Saarikoski et al., 2008; Lovrik et al., 2016; Vizcaya-Moreno et al., 2015). Overall, the study shows the CLES+T sub dimensions were effective for the reported students' satisfaction from the clinical learning environment.

One of the important findings was the relationship between the length of clinical training and nursing students' gratification; for example, in Germany, the ratio of clinical training is 54% and the supervisory relationship is mostly individual, so the students' satisfaction was 74% (Bergjan & Hertel, 2013), whereas in the Czech Republic, with 50% ratio of clinical placement and group supervisory, the satisfaction was lower (Antohe et al., 2016).

It has been reported that students' motivation, fulfillment, and the nature of learning can be influenced by numerous factors, including the practice setting, learning opportunity and clinical facilities which all together are known as the pedagogical atmosphere (Williams & West, 2012). In Nepal, the most influential factor for students' satisfaction according to CLES+T scale was that the pedagogical atmosphere had a positive ward for their learning needs. In Belgium, the supervisory relationship was as much as important factor to contribute to a good clinical learning environment. In other countries, this factor was the second or third in importance after supervisory relationship (Nepal et al., 2016; Witte et al., 2011).

Most studies used the exploratory factor analysis. They found that all the items in the CLES+T scale had limited discriminating characters which means that there is no high negative or high positive items (Witte et al., 2011), but in a few countries, like Nepal and Croatia, according to the culture and educational system, the CLES+T sub dimensions were reorganized and combined together to make the questionnaire reliable (Nepal et al., 2016; Lovric et al., 2016). Therefore, the structure of scale differs from the original one but has a similar output.

In all the studies, the selected samples were from clinical placement in hospital settings such as surgical, medical, pediatric, psychiatric, gynecology, geriatric, oncology and social sector units. It appears that, for the sample (n=549) chosen

for the study in Finland by (Saarikoski et al., 2008) there were no specific ward validations by CLES+T scale. Due to the high level of patient turnover the nursing staff didn't have enough time to enhance the relationship with the temporary group of student nurse (Nepal et al., 2016), however the ward manager played a vital role to create a positive and welcoming ward towards the student's learning process (Henriksen et al., 2012). In the Bezuidenhout et al. study, the ward manager's role consists in welcoming the students, giving them an adequate introduction and encouraging their inspiration in the ward (Papastavrou et al., 2010).

The main interest of the current study is that it represents the first attempt to explore and clarify nursing bachelors' education among countries with different cultures and educational training using a common standardized instrument. Our findings confirm that CLES+T scale is adjusted to assess the gratification of nursing students' clinical situation.

5.2 Discussion for the objective: To translate the clinical learning environment, supervision and nurse teacher scale (CLES+T) to Persian language.

Translation and adaptation procedures were made according to the cross-cultural validation method used by Hebert et al. which includes five steps:

1. Selection of a reliable English-language instrument
2. Translation and back-translation by translators
3. Committee revision to assess both versions
4. Pretest (with approximately 10 participants)
5. Appraisal of the psychometric properties of the tool (Blanger et al., 2015)

The Iranian version of the CLES+T was translated and back-translated following a specific step process (Papastavrou et al., 2010). The Persian version was reviewed by an expert panel. After the consensus, a meeting was held to evaluate the semantic, idiomatic, cultural and conceptual items. The aim of this

step was to evaluate if the words or statements used in the original context conveyed the same meaning in the translated version for the target population. The expert committee reviewed the questions considering the content validity in order to assess the acceptability and understanding of the instrument by the target population. When any member of the panel disagreed with any term of the translation, other suggestions were analyzed, in order to achieve a better understandability and equivalence with the Iranian culture (Soemantri et al., 2010).

The acceptance of the changes was validated when 80% of the panel member agreed with the suggestion. In this step, the face and content validity of the instrument were evaluated by the expert panel members and an agreement of the Persian version was established. In the approved Persian version the term of “ward manager” was replaced by “head nurse” considering the working system in the Iranian hospitals. Also, the term of “nurse teacher” was replaced by “mentor” according to the educational culture in the Iranian nursing universities. On the other hand, in the Swedish version of the CLES+T scale, according to their educational conditions, the students received support and learning from a clinical supervisor, and they accordingly replaced the term of “nurse teacher” by “supervisor” (Johansson et al., 2010). However, in the Greek version of the CLES+T scale all the items were translated and used exactly as in the original version (Papastavrou et al., 2015).

A sample of 10 students who were studying at nursing universities in January 2019 were selected to participate in the study. The number of participants in the pre-test step was defined as suggested in literature for this step (Freitas et al., 2014). The adapted version of the CLES+T was evaluated carefully by those students. If the student did not understand one item, she/he should leave it blank. All the students left questions number 7 and 8 blank; they couldn't understand nor distinguish the differences between these 2 questions. For this reason, the researcher decided to put these questions together after prior approval by the expert panel.

There are 33 items in the Iranian version of the CLES+T questionnaire instead of 34 items in the original one (Saarikoski et al., 2008). The Croatian version of the CLES+T also includes 33 instead of 34 plus demographic questions; in this version, “the ward manager was a team member” item was combined with “the nurse teacher was like a member of the nursing team” item. According to the Croatian system, the role of ward manager and nurse teacher were performed by a mentor (Lovric et al., 2016).

In the Iranian nursing universities, the clinical supervisor is identified as a person who performs clinical guidance (Sharif et al., 2005). The sense of supervision is used within the questionnaire as a powerful system which can encourage, support and improve the professional practice of the nursing students (Johns, 2003).

In previous studies, the term of supervisor varied from a person who is employed solely by the hospital or one who is employed by the university but students mostly agree that having someone out of the clinical unit as a supervisor would be more effective for nursing students' assessment (Aliafsari et al., 2018). In most universities of Iran the supervision is performed by mentors who are hired by a nursing university. This mentor should be pedagogically-oriented, scientifically trained and aware of the curriculum content to support and evaluate the nursing students (Johansson et al., 2010).

Supervision can be provided on an individual or group basis. A successful progress during the work process is significantly specified by expert supervision during clinical practice. In Iran most of the universities perform group supervision (Allen et al., 2008). In Norway, the majority of students are supervised individually (Henriksen et al., 2012); however, in Eastern European countries the group supervisory model is clearly more common; for example, in Romania and Hungary more than 83% of student nurses were supervised in groups (Antohe et al., 2016).

The term nurse teacher refers to the role of a qualified nursing teacher employed by an educational department of the university. This teacher's role consists in teaching the nursing students in all aspects of theory and preparing them for the

practical parts (Saarikoski et al., 2008). It should be noted that nurse teachers mostly used a reference book or observation checklist and students normally don't have a chance to find any theoretical part in the clinical practice (Aliafsari et al., 2018).

A pilot test was carried out within 35 students. The condition for participants to take part in this pilot test was having passed clinical practice for approximately half of the time or credit in the recent term. The target students informed about the research plan and asked whether they were willing to participate or not, they received oral information in the classroom at the university before filling out the questionnaire. The target of this pretest was to determine the internal consistency of the items so Cronbach's alpha was calculated considering that a value above 0.70 shows a high degree of internal consistency (Soemantri et al., 2010).

Cronbach's alpha internal consistency reliability of the Iranian CLES+T which was calculated only by 35 participants, for the total scale was 0.81, the highest number was for the supervisory relationship; 0.89 and the lowest one was for the premises of nursing on the ward; 0.70, these values reverberate those obtained in the original version of CLES+T, ranging from (0.77-0.96) (Saarikoski et al., 2008).

The result of the evaluation of the face validity, internal consistency and reliability showed that the Iranian version of the CLES+T instrument is suitable to evaluate the clinical learning environment for nursing students in hospital practice. It confirmed the previous study by Ohman which said "CLES is an instrument originally developed for the evaluation of the clinical learning environment of nursing students" (Ohman et al., 2015). The systematic review conducted by Soemantri et al showed that the CLES+T instrument is the most appropriate scale for undergraduate medical, postgraduate medical and nursing education (Soemantri et al., 2010).

5.3 Discussion for the objective: To validate the Clinical Learning Environment, Supervision and Nurse Teacher (CLES+T) questionnaire among Iranian undergraduate nursing students.

Having been translated into more than 27 languages, CLES+T is now used in over 40 countries (Ozga et al, 2020). In this study we propose the Persian version of this research instrument, as it displays good validity and reliability levels and can be recommended for use in evaluation of clinical learning environment, supervisions, and the role of nurse teacher in post graduate nursing education.

The results of the study showed that the majority of students were female and single, they lived with their parents and didn't have any nursing or nurse assistant background. Most of them were second and third year nursing students and 64% of them reported being motivated and satisfied with the clinical learning. In Iran nursing is considered a female profession. Therefore, nursing is a poor career choice among men, as a result of which most men are not satisfied with nursing as their job (Hanifi, 2013).

The main goal of nursing education is to train competent and qualified nurses who are knowledgeable and skillful enough to improve the quality of care provided to patients. In other words, nursing education basically focuses on the transmission of knowledge to students (as future nurses) and assists them to achieve the necessary skills and attitudes to become capable clinical nurses (Mokhtari et al., 2015).

Nurse educators as students' advisors in the practice part, play a decisive role in the learning process. The shortage of experienced practical educators can have significant effects on training process of nursing studies, leading to unqualified nurses in the future (Heydari et al., 2015). Unlike previous studies (Bergian & Hertel, 2013; Henriksen et al., 2012; Johansson et al., 2010; Papastavrou et al., 2010; Saarikoski et al, 2008), our study identifies the supervisory relationship as the most significant factor in the clinical learning environment. Supervisors can contribute significantly to the preparation of students to obtain academic and clinical experience. Nursing students expect support -both emotional and academic- from their supervisors as well as to be able to meet with them on

regular basis (Hajhosseini et al., 2018). In our study unlike previous study (Bergian & Hertel, 2013; Henriksen et al., 2012; Johansson et al., 2010; Papastavrou et al., 2010; Saarikoski et al, 2008) the supervisory relationship was identified as the most significant factor in the clinical learning environment.

One of the main challenges of nursing education is the evaluation of clinical qualification because evaluation can show the students' strengths and weaknesses abilities and their required resources. In 97% of Iranian nursing schools clinical educators are mostly novice nurses who are hired by the University to supervise and evaluate the nursing students in clinical practice and they are called "mentors" or in Persian language (nazer). In our study, the majority of students were supervised by a mentor (nazer) during their clinical learning. Supervisors guide students' clinical learning through a wide range of strategies, such as providing collaboration between the university and the ward staff, encouraging student's participation in wards activities and assessing their clinical competence improvement. Therefore, the role of mentors is mainly to establish a relationship between the university and the health care centers to facilitate learning clinical experiences (Bigdeli et al., 2015).

An analysis of the data related to the Persian students nurses clinical placements, indicates that most of the students had group supervision due to the shortage of faculty mentor and the large number of students and nursing schools. Therefore, in the clinical part lots of students in different wards supervised with one person as a mentor who has responsibility to improve practical skills. Group supervision cause some problems such as students being ignored and unattended by the mentor and reduce the opportunities for practical experiences (Heydari et al., 2013). According to our study most of the students had meeting with their mentor at least once a week.

Iranian, Finish and Swedish students perceived the role of nurse teacher as an important and unique role (Johansson et al., 2010). The strongest factor on the Persian version CLES+T was sub dimension "role of nurse teacher" with high factor loading from 0.72 to 0.83. This can be reasonable because in Iran nursing teacher is a faculty member and does not work in the clinical part. For this reason, students spend theory time with one teacher who tries to raise theoretical

knowledge (Kaydani et al, 2017). The nurse teacher are acknowledge in undergraduate nursing education and this is visible in Poland version of instrument (Ozga et al, 2020).

In our study the dimension “Role of nurse teacher” is divided into: “nurse teacher as enabling the integration of theory and practice”, “relationship among the student, mentor and nurse teacher”, “cooperation between placement staff and nurse teacher”. One of the necessary preparations for a good clinical education is the possession of a competent teacher in the field of theoretical education (Kaydani et al, 2017).The sub-dimension of pedagogical atmosphere was found to be the second strongest factor in our study with loading from 0.56 to 0.81

According to a review study in Iran in 2016, four main factors have a strong effect on clinical education; teacher’s characteristics, students’ characteristics, learning atmosphere and the power of the educational program (Bagheri & Bazghaleh, 2016). The CLES+T scale in general has the ability of covering and assessing these factors. The weakest factor in this study was the nursing care on the ward, as other studies (Saarikoski et al, 2008; Vizcaya et al, 2015; Atay et al, 2018).

The leadership style of the ward manager has one of the lowest average in the Persian version of CLES+T. In Iran, due to shortage of nursing personnel, a large number of patients and sometimes a lack of facilities, nursing is one of the most stressful profession. And the ward manager is one of the most important elements to create a positive and negative environment for the staff. The ward manager can develop a good management model to improve students’ learning (Kilcullen, 2007).

The previous study of the CLES+T scale confirmed the five-factor structure of the questionnaire (Henriksen et al., 2012; Johansson et al., 2010; Tomietto et al., 2009) as the original one (Saarikoski et al., 2008). In our study the methodology adheres to the steps defined by Saarikoski et al, 2008 for the EFA, a few differences emerged. The Persian version EFA showed differences in a factor loaded compared with the finish sample (Saarikoski et al., 2008). The Persian version of CLES+T structure was divided in 9 factors, the pedagogical

atmosphere dimension is divided in 2 factors, the learning environment at the beginning of the practice with item (the staffs were easy to approach) and item (I felt comfortable going to the ward at the start of the shift) and learning environment during the practice.

In our study the methodology adhere to the steps defined by Saarikoski et al, 2008 for the EFA, a few differences emerged. The Persian version EFA showed differences in a factor loaded compared with the finish sample (Saarikoski et al., 2008). In our study the 5-factor model represents 49.77% variance of the original variability and the distribution of the items. Some factors are different from the theoretical structure of the original version of the scale (Saarikoski et al., 2008); the EFA showed that the Persian version in 8-factors represents 62.19% of the original variability; nevertheless, there is still some mixed items that they are not related. Persian version of CLES+T structure when divided in 9 factors showed 65.35% of variance of the original variability, on 9-factors Persian model the Pedagogical atmosphere dimension is divided in 2 factors, learning environment at the beginning practice with item (the staffs were easy to approach) and item (I felt comfortable going to the ward at the start of the shift) and learning environment during the practice.

The dimension of supervisory relationship is divided in two sub dimensions: "attitude in the supervisory relationship and value in the supervisory relationship". As we mentioned previously the dimension "role of nurse teacher" is divided in three sub dimensions. The reason for this may have been that in the Persian model we mixed 2 items in the pedagogical atmosphere and made it one, but further research would be required to confirm this possibility. Our explanation for these differences in factor loading was conducted by a CFA. Values of chi-square RMSEA, CFI, NFI suggested that the Persian model of scale with 9 factors is considered a good fit in the questionnaire and the structure of data in the RMSEA is less than 0.05. The setting is considered higher the 9-factors model value was 0.05 and the original model was 0.08, it had a close value to reasonable fit so this model is stronger than the original model with five factor (Saarikoski et al., 2008) and the Spanish version with 7 factors (Vizcaya, 2015) and the Watson study in news land with 4 factors (Watson et al, 2014)

The internal consistency coefficients for the Persian version of CLES+T were between 0.69- 0.85. Focusing on this new scale, the items obtained appropriate values for internal consistency and inter item correlations. In addition their alpha values were comparable with the German version (from 0.82 to 0.96), the Dutch version (from 0.80 to 0.95) (De Witte et al., 2011) and the Italian version (from 0.78 to 0.95) (Tomietto et al., 2009).

Also developing a universal instrument to evaluate clinical learning environment internationally, robust investigations in different nations with various cultural and social backgrounds are required.

6 Conclusion

The CLES+T is a valuable tool to evaluate satisfaction with clinical learning and identify key factors in the clinical learning environment of student nurses in different countries from distinct geographical, social and cultural areas. The most important factors across countries appear to be a good atmosphere in the clinical ward together with individualized and thorough supervision.

Cultural particularities and the structure of the clinical education are affected by the translation of CLES+T in different languages but the results illustrated that in general internal consistency and consistency of five sub measurements of CLES+T were high and therefore supported legitimacy and dependability of the instrument so it could be recognized as a trustworthy instrument for national and international studies. Analyzing students' perceptions related to CLES+T discloses the shortage and potentially demonstrates effective review of clinical practice which could be good to improve B.Sc. nursing programs. There are no significant differences in the mean value related to different topographical territories and different educational systems.

Nursing clinical education systems in Iran are not the same and are different from the different aspects: 1/ the type of student and the patient culture, 2/ the social and religious factors, and 3/ the policies governing medical education. The results of the evaluation of the face validity and internal consistency and reliability showed that the Persian version of the CLES+T instrument is suitable to evaluate the clinical learning environment of nursing students.

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8 *Appendix*

8.1 Appendix 1

Original author authorization

Mikko Saarikoski
RN, PhD, Adjunct Professor / Docent
Camilla Strandell-Laine
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University of Turku, Department of Nursing Science, Finland

Agreement form

01.01.2015

Agreement for using the Clinical Learning Environment, Supervision and Nurse Teacher (CLES+T) evaluation scale

I agree to abide by the following principles in using the CLES+T evaluation scale as a research tool in my/ our empirical study:

- The CLES+T should only be used in its original form (minor alternations are permissible, for example in order to ensure the terminology of CLES+T reflects different cultural aspects). All other changes should be reported to the authors.
- Any research reports that have used the CLES+T should acknowledge the original source by using the following reference: Saarikoski et al. 2008. The nurse teacher in clinical practice: Developing the new sub-dimension to the Clinical Learning Environment and Supervision (CLES) scale. International Journal of Nursing Studies 45: 1233-1237.
- The instrument cannot be published in its original form (e.g. as Appendix) without the permission of the copyright holder, Elsevier Science Ltd. UK. The CLES+T scale has been published originally in the above article.
- Authors should be sent one copy of publications in which the CLES+T scale has been used as a research instrument (see the address above)

Name of the re-user: Roshanak Kakavan


your signature

Research organisation: University of Barcelona

Address: Feixa d'Arges s/n

Name of the research (or research project): Translation and validation of clinical learning environment, supervision and nurse teacher (CLES+T) in IRANIAN language

Language version: Farsi

We give the permission: 
Camilla Strandell-Laine

Date: 8.5.2017

8.2 Appendix 2

Student questionnaire in English version:

Dear Student,

Please Do Not write your name or Student number on the questionnaire.

Please read the following statements. For each statement, please circle the option that best describes your opinion.

Demographic information

What is your age range?

1. Under 20 years
2. 21-30 years
3. 31-40 years
4. 42 or over

What is your gender?

1. Male
2. Female

What is your current academic class?

1. Year 3
2. Year 4

Satisfaction with clinical placement

I am satisfied with the clinical placement that has just ended

1 2 3 4 5

Clinical Learning Environment, Supervision and Nurse Teacher (CLEST+T) evaluation scale

(Saarioski& Leino-Kilpi 2008)

Circle the responses that BEST describe PRIMARY HEALTH CARE clinical placement.

Evaluation scale:

1= fully disagree

2= disagree to some extent

3= neither agree nor disagree

4= agree to some extent

5= fully agree

The learning environment

The atmosphere:

The staff were easy to approach

1 2 3 4 5

I felt comfortable going to the ward at the start of the shift

1 2 3 4 5

During staff meetings (e.g. before shifts) I felt comfortable taking part in discussions

1 2 3 4 5

There was a positive atmosphere on the ward

1 2 3 4 5

The staff was generally interested in student supervision

1 2 3 4 5

The staff learned to know students by their personal name

1 2 3 4 5

There were sufficient meaningful learning situations on the ward?

1 2 3 4 5

The learning situations were multi-dimensional in terms of content

1 2 3 4 5

The ward? Can be regarded as a good learning environment

1 2 3 4 5

Leadership style of the Ward Manager (WM)

The WM regarded the staff on his/her ward as a key resource

1 2 3 4 5

The WM was a team member

1 2 3 4 5

Feedback from the WM could easily be considered as a learning situation

1 2 3 4 5

The effort of individual employees was appreciated

1 2 3 4 5

Premises of nursing on the ward

The ward nursing philosophy was clearly defined

1 2 3 4 5

Patients received individual nursing care

1 2 3 4 5

There were no problems in the information flow related to patients' care

1 2 3 4 5

Documentation of nursing (e.g. nursing plan, daily recording of nursing procedures, etc.) was clear

1 2 3 4 5

The supervisory relationship

In this form, the concept of supervision refers to guiding, supporting and assessing of student nurses made by the clinical staff nurse. Supervision can occur as individual supervision, or as group (or team) supervision.

Occupational title of supervisor:

- | | |
|------------------------|---|
| Nurse | 1 |
| Nurse specialist | 2 |
| Assistant ward Manager | 3 |
| Ward Manager | 4 |

Other

Occurrence of supervision: (circle one only)

- 1- I did not have a supervisor at all
- 2- A personal supervisor was named, but the relationship with this person did not work during placement
- 3- The supervisor changed during the placement, even though no change had been planned
- 4- Supervisor varied according to shift or place of work
- 5- Same supervisor had several students and was a group supervisor rather than an individual supervisor
- 6- A personal supervisor was named and our relationship worked during this placement

How often did you have separate private unscheduled supervisions with the supervisor (without the clinical instructor)?

- 1- Not at all
- 2- Once or twice during the course
- 3- Less than once a week
- 4- About once a week
- 5- More often

The content of supervisory relationship:

My supervisor showed a positive attitude towards supervision

- 1 2 3 4 5

I felt that I received individual supervision

1 2 3 4 5

I continuously received feedback from my supervisor

1 2 3 4 5

Overall I am satisfied with the supervision I received

1 2 3 4 5

The supervision was based on a relationship of equality and promoted my learning

1 2 3 4 5

There was a mutual interaction in the supervisory relationship

1 2 3 4 5

Mutual respect and approval prevailed in the supervisory relationship

1 2 3 4 5

The supervisory relationship was characterized by a sense of trust

1 2 3 4 5

Role of the clinical instructor

Clinical instructor as enabling the Integration of theory and practice

In my opinion, the clinical instructor was capable to integrate theoretical knowledge and everyday practice of nursing

1 2 3 4 5

The instructor was capable to operationalize the learning goals of this clinical placement

1 2 3 4 5

The clinical instructor helped me to deduce the theory-practice gap

1 2 3 4 5

Cooperation between clinical placement and clinical instructor:

Clinical instructor was like a member of the nursing team

1 2 3 4 5

Clinical instructor was capable to give his or her pedagogical expertise to the clinical team

1 2 3 4 5

The clinical instructor and the clinical team worked together in supporting my learning

1 2 3 4 5

Relationship among Student, supervision registered nurse and clinical instructor

The common meetings between myself, supervising registered nurse and clinical instructor were comfortable

1 2 3 4 5

In our common meetings I felt that we were colleagues

1 2 3 4 5

The focus of the meetings was on my learning needs

1 2 3 4 5

Thank you for your time and help!

8.3 Appendix 3

CLEST scale in Persian version:

(CLEST) فرم ارزیابی محیط فراگیری آموزش های درمانی، نظارت و آموزش پرستاری

(Saarikoski and Leino-Kilpi 2008)

عبارات زیر در خصوص محیط یادگیری، نظارت و نقش مدرس پرستار، هر کدام با عنوان مشخص خود در نظر گرفته شده اند.

برای هر یک از موارد زیر، گزینه ای را که به عقیده شما بهترین توصیف از آن مورد را بیان می کند انتخاب کنید.

مقیاس سنجش:

1= کاملاً مخالفم

2= تقریباً مخالفم

3= نظری ندارم

4= تقریباً موافقم

5= کاملاً موافقم

محیط یادگیری

فضای آموزشی:

سبک رهبری مدیر بخش :

مدیر بخش، کارکنان را در بخش خود به عنوان یک منبع کلیدی در نظر می
1.....2.....3.....4.....5 گرفت

مدیر بخش، یکی از اعضای تیم

1.....2.....3.....4.....5 بود.....

بازخورد مدیر بخش، یک نکته ی آموزشی برداشت می

1.....2.....3.....4.....5 شد

از تلاش کارکنان شخصاً قدردانی می شد.....

1.....2.....3.....4.....5

مراقبت پرستاری در بخش:

فلسفه و حوزه اختیارات پرستاری به وضوح تعریف شده

.....1.....2.....3.....4.....5 بودند

بیماران مراقبت های پرستاری را به صورت فردی و اختصاصی دریافت می

.....1.....2.....3.....4.....5 کردند

در جریان اطلاعات مربوط به مراقبت از بیماران هیچ مشکلی وجود

.....1.....2.....3.....4.....5 نداشت

مستند سازی پرستاری (مثلا برنامه پرستاری، ضبط روزانه روشهای پرستاری و غیره) به وضوح مشخص

.....1.....2.....3.....4.....5 بود

در این فرم، مفهوم "نظارت" اشاره به هدایت، حمایت و ارزیابی دانشجویان پرستاری توسط پرسنل و خدمه ی بخش دارد. نظارت می تواند به عنوان نظارت فردی یا نظارت بر گروه (یا تیم) صورت گیرد. مفهوم مربی به معنای یک سوپروایزر شخصی است.

حضور نظارت: (فقط دور یک گزینه دایره بکشید)

من هیچ سوپروایزری نداشتم. عنوان شغلی سوپروایزر:

یک سوپروایزر تعیین شد، اما ارتباط با این شخص میسر نبود. 1= پرستار

سوپروایزر من در طول دوره تغییر کرد، هر چند هیچ تغییری پیش بینی نشد. 2= پرستار متخصص

سوپروایزر من بر اساس شیفت یا محل کار تغییر می کرد. 3= دستیار مدیر بخش

یک سوپروایزر تعیین شد و ارتباط با این شخص به خوبی میسر بود. 4= مدیر بخش

روش دیگری از نظارت، لطفاً مشخص کنید..... 5= غیره (توضیح دهید).....

جلسه ی نظارت خصوصی خارج از برنامه با سوپروایزر 1= هیچ وقت

(بدون حضور مدرس پرستاری)، هر چند وقت یکبار برگزار می شد؟ 2= کلاً یک یا دو بار

3= کمتر از هفته ای یکبار

4= تقریباً هفته ای یک بار

5= بیشتر اوقات

در مورد روابط با سوپروایزر:

برای هر یک از موارد زیر، گزینه ای را که به عقیده شما بهترین توصیف از آن مورد را بیان می کند انتخاب کنید.

مقیاس سنجش:

1= کاملاً مخالفم

2= تقریباً مخالفم

3= نظری ندارم

4= تقریباً موافقم

5= کاملاً موافقم

سوپروایزر من، نگرش مثبتی نسبت به نظارت نشان می

.....1.....2.....3.....4.....5 داد

احساس کردم که من نظارتی کاملاً شخصی را دریافت

.....1.....2.....3.....4.....5 کردم

به طور مداوم بازخورد هایی از سوپروایزر دریافت می

.....1.....2.....3.....4.....5 کردم

..... به طور کلی من از نظارت دریافتی ام راضی هستم.....

.....1.....2.....3.....4.....5

نظارت سوپروایزر بر پایه ی برابری و یادگیری من استوار

.....1.....2.....3.....4.....5 بود

..... تعامل متقابل در روابط با سوپروایزر وجود داشت.....

.....1.....2.....3.....4.....5

احترام متقابل در روابط نظارتی غالب

.....1.....2.....3.....4.....5 بود

.....

رابطه نظارتی با حس اعتماد همراه

.....1.....2.....3.....4.....5 بود

.....

نقش مدرس پرستاری

مدرس پرستاری، یکی از اساتید دانشگاه است (که توسط دانشگاه استخدام شده است.) که معمولاً انتصابات افراد کلینیک را هم بر عهده دارد. اظهارات زیر در مورد ارتباط مدرس پرستاری، هر کدام با عنوان مشخص خود در نظر گرفته شده اند.

مقیاس سنجش:

1= کاملاً مخالفم

2= تقریباً مخالفم

3= نظری ندارم

4= تقریباً موافقم

5= کاملاً موافقم

برای هر یک از موارد زیر، گزینه ای را که به عقیده شما بهترین توصیف از آن مورد را بیان می کند انتخاب کنید.

مدرس پرستاری، به عنوان ادغام کننده ی دروس عملی و تئوری:

به نظر من، مدرس پرستاری توانست دانش تئوریک و عملی روزمره پرستاری را به خوبی ادغام
1.....2.....3.....4.....5کند

مدرس توانست اهداف آموزشی پرستاری را عملی

1.....2.....3.....4.....5کند

معلم پرستار به من کمک کرد تا شکاف میان تئوری و عمل را کاهش
1.....2.....3.....4.....5دهم

همکاری بین کارکنان و مدرس پرستار:

مدرس پرستاری همانند یک عضو تیم پرستاری

1.....2.....3.....4.....5بود

مدرس پرستاری قادر به ارائه مهارت های آموزشی خود به تیم

1.....2.....3.....4.....5بود

معلم پرستار و تیم بالینی در جهت یادگیری من، با یکدیگر همکاری می

1.....2.....3.....4.....5کردند

رابطه بین دانشجو، مربی و معلم پرستاری:

جلسات مشترک بین خودم، مربی و مدرس پرستاری تجربه راحتی

1.....2.....3.....4.....5بود

در جلسات مشترکمان، احساس می کردم که با یکدیگر همکار

1.....2.....3.....4.....5هستیم

تمرکز بر جلسات از نیازهای یادگیری من

1.....2.....3.....4.....5بود

.....

با تشکر از همکاری شما.

8.4 Appendix 4

School permission

Dear

The head of the School of nursing

I am writing to request permission to conduct a research study at your institution, I am currently enrolled in the PhD program of nursing and health at the University of Barcelona, Spain and am in the process of writing my doctoral thesis. The study is entitled: "Translation and Validation of clinical learning environment and nurse teacher scale (CLES+T) in Iranian language". Under the supervision of Doctor Nuria Fabrellas, nfabrellas@ub.edu

I hope that the school administration will allow me to invite all second, third and fourth nursing students from the school to anonymously complete a 3-page questionnaire (copy enclosed). Interested students, who volunteer to participate, will be given a consent form to be signed by them and returned to the primary researcher at the beginning of the survey process.

If approval is granted, student participants will complete the survey in a classroom or other quiet setting on the school site. The survey process should take no longer than half an hour.

The survey results will be pooled for the thesis project and individual results of this study will remain absolutely confidential and anonymous. Should this study be published, only pooled results will be documented. No costs will be incurred by either your school/center or the individual participants.

Your approval to conduct this study will be greatly appreciated. I will follow up with a telephone call next week and would be happy to answer any questions or concerns that you may have at that time. You may contact me at my email address: roshi_k58@yahoo.com

If you agree, kindly sign below and return the signed form in the enclosed self-addressed envelope. Alternatively, kindly submit a signed letter of permission on your institution's letterhead acknowledging your consent and permission for me to conduct this survey/study at your institution.

Sincerely,

Roshanak Kakvan, PhD student of nursing and health

University of Barcelona.

8.5 Appendix 5

Student awareness

Dear students,

My name is Roshanak Kakvan, I am currently pursuing doctoral study in the University the Barcelona, Spain.

My research plan is: "Translation and Validation of clinical learning environment and nurse teacher scale (CLES+T) in Iranian language". The aim of this study will be to validate the CLES+T questionnaire and evaluate students' satisfaction level of clinical learning environment.

Maybe it will help to improve the quality of the practical part of nursing education in Iran.

The data will be carried out by a questionnaire, I would be very grateful to invite all of you as a participants to fill out the 3-page questionnaire sheet that will be the data for my research. Evaluation of the project will be based on the questionnaire.

I will guarantee all information provided will be treated strictly as confidential and purely for academic purposes and promise not to reveal your name in any part of the research.

Sincerely,

Roshanak Kakvan

8.6 Appendix 6

Informed consent

Translation and Validation of clinical learning environment and nurse teacher scale (CLES+T) in Iranian language

University of Barcelona/ Spain, Doctoral school of nursing and health

My name is Roshank Kakvan, I am PhD student of nursing and health in the University of Barcelona, and I am going to do my doctoral thesis on validation of CLES + T instrument among nursing students in Iran.

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study:

The purpose of this study is to assess the validation of international reliable scale (CLES+T) among Iranian nursing students for the first time, to determine the level of nursing student satisfaction of clinical learning environment and finally to make some suggestion to decision making and helping to improve the quality of the practical part of nursing education in Iran.

What you will be asked to do in the study:

You will be asked to participate in this research and fill out the questionnaire with 45 questions.

Time required:

Time required will be maximum 45 minutes.

Risks and Benefits:

There is no risk for the study, and the potential benefit of the study will help the researcher to collect the data for project.

Incentive or Compensation:

There is no extra credit or other incentive for participating; therefore, you will not be adversely affected in any way if you choose not to participate.

Confidentiality:

Your identity will be kept confidential to the extent provided by law. Your information will be assigned a code number. The list connecting your name to this number will be kept in a locked file. When the study is completed and the data have been analyzed, the list will be destroyed. Your name will not be used in any report or publication.

Voluntary participation:

Your participation in this study is completely voluntary. There is no penalty or loss of benefit for choosing not to participate.

Right to withdraw from the study:

You have the right to withdraw from the study at any time without consequence or penalty.

Whom to contact if you have questions about the study:

If you have any questions about your rights as a subject/participant in this research you may contact me on this phone number: 9121025609 or the email address: roshi_k58@yahoo.com and for further

information you may contact the director of this project Dr Nuria Fabrellas at the email address: nfabrellas@ub.edu .

Agreement:

If you wish to participate in this study, please sign the form below. A signature will indicate agreement to participate.

Participant's Name:

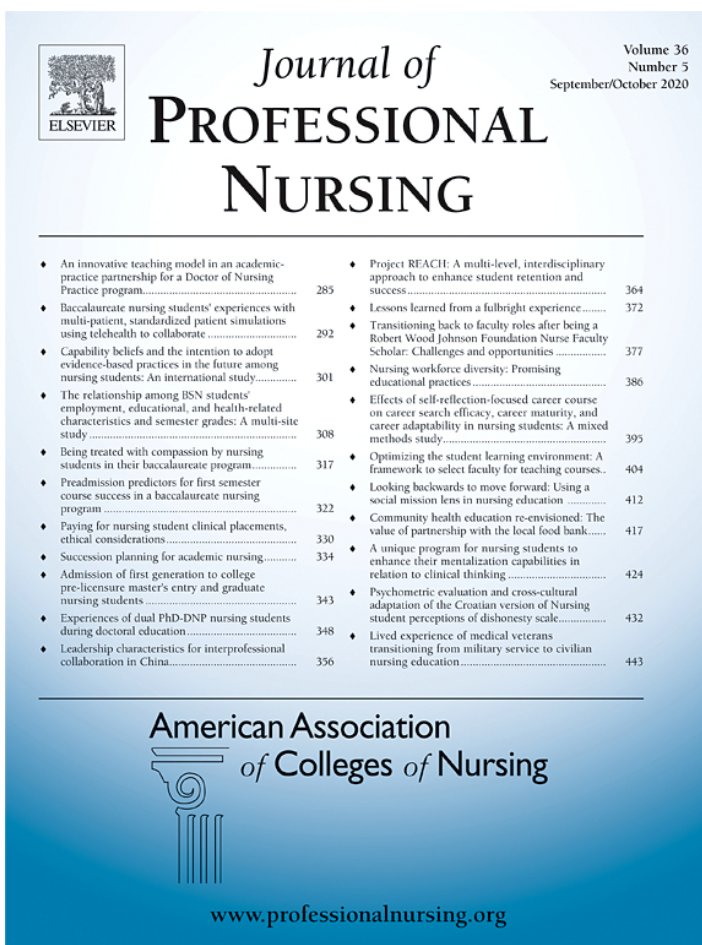
Signature _____

Date _____


9 Manuscripts


9.1 Manuscript:

The quality of CLES+T instrument in nursing education: a systematic review (submitted)



The image shows the cover of the Journal of Professional Nursing, Volume 36, Number 5, September/October 2020. The cover features the Elsevier logo and the title 'Journal of PROFESSIONAL NURSING'. Below the title is a table of contents with two columns of articles and their page numbers. At the bottom of the cover is the logo for the American Association of Colleges of Nursing and the website address www.professionalnursing.org.

	<i>Journal of</i> PROFESSIONAL NURSING	Volume 36 Number 5 September/October 2020
<ul style="list-style-type: none">• An innovative teaching model in an academic-practice partnership for a Doctor of Nursing Practice program..... 285• Baccalaureate nursing students' experiences with multi-patient, standardized patient simulations using telehealth to collaborate 292• Capability beliefs and the intention to adopt evidence-based practices in the future among nursing students: An international study..... 301• The relationship among BSN students' employment, educational, and health-related characteristics and semester grades: A multi-site study 308• Being treated with compassion by nursing students in their baccalaureate program 317• Preadmission predictors for first semester course success in a baccalaureate nursing program 322• Paying for nursing student clinical placements, ethical considerations 330• Succession planning for academic nursing 334• Admission of first generation to college pre-licensure master's entry and graduate nursing students 343• Experiences of dual PhD-DNP nursing students during doctoral education 348• Leadership characteristics for interprofessional collaboration in China..... 356	<ul style="list-style-type: none">• Project REACH: A multi-level, interdisciplinary approach to enhance student retention and success 364• Lessons learned from a fullbright experience..... 372• Transitioning back to faculty roles after being a Robert Wood Johnson Foundation Nurse Faculty Scholar: Challenges and opportunities 377• Nursing workforce diversity: Promising educational practices 386• Effects of self-reflection-focused career course on career search efficacy, career maturity, and career adaptability in nursing students: A mixed methods study..... 395• Optimizing the student learning environment: A framework to select faculty for teaching courses..... 404• Looking backwards to move forward: Using a social mission lens in nursing education 412• Community health education re-envisioned: The value of partnership with the local food bank..... 417• A unique program for nursing students to enhance their mentalization capabilities in relation to clinical thinking 424• Psychometric evaluation and cross-cultural adaptation of the Croatian version of Nursing student perceptions of dishonesty scale..... 432• Lived experience of medical veterans transitioning from military service to civilian nursing education 443	

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The quality of CLES+T instrument in nursing education: a systematic review

Abstract

Background: Clinical learning objectives are affected by a large number of factors, as individual attitudes, experience, problem-solving ability. All these factors occurs within a complex and dynamic learning environment.

Aim: The aim of this study is to investigate the Clinical Learning Environment, supervision, and nurse teacher (CLES+T) scale in 10 countries all around the world.

Method: This study was carried out by systematic review and meta-analysis (PRISMA) guideline.

Results: The review includes 7 cross-sectional studies.

Conclusion: We found the supervisory relationship with high percent of total variances was the strongest factor in clinical learning environment. The strong point of this study includes in being the first attempt to compare a standardized instrument among countries whit different culture and educational training. Implications for nursing and policy: Academic and clinical stakeholders must collaborate and plan every step of training to bring nursing students and professionals the best experience in a variety of patient care environments.

Keywords: *clinical learning environment; nursing student evaluation; CLES+T scale; psychometric test; nurse education; nursing satisfaction.*

The quality of CLES+T instrument in nursing education: a systematic review

Introduction

The vocation of nursing requires practitioners to have theoretical knowledge, clinical skills and creative thinking in their undergraduate degree (Doyle et al., 2017). Teaching in the clinical placement plays a key role in nursing education (Bos et al., 2015).

Due to the growth of a multicultural society and mass migration all over the world, nursing university curriculum must have an international standard of character (Mlikkonen et al., 2017). The aim of nursing education is to enhance the student's capacity to ensure they are equipped to supply safe and quality patient care (Chupai, 2016). Nursing education is divided into academic lectures and clinical practice, both great challenges in nursing programs (Choi & Bakken, 2013). A great deal of attention has been given to the clinical learning environment to emphasize the importance of multi-dimensional placement for student's learning (Nagelsmith et al., 2012).

Clinical learning of nursing students occurs in facilities where patients receive care and healthcare professionals are present. In other words, an atmosphere conducive to physical, psychosocial and organizational dimensions (Ohman et al., 2016). Therefore, allowing a nursing student to transfer "Knowing" to "Doing" by using both their thinking and practical skills for problem-solving. Commonly, clinical practice is recognized as the most anxiety ridden activity in nursing programs. Unfamiliar surroundings, lack of experience, fear of errors, fear of patients or technology related error, in addition to being assessed by a supervisor (Shartif & Masoumi, 2005) amount to a high level of anxiety, which in consequence, can cause a difficult optimal clinical learning environment (Clayes et al., 2015). The clinical learning atmosphere includes four adjectives: (1) Physical appearance (2) psychosocial and cooperation factors (3) cultural factors (4) training and

learning components (Flott & Linden, 2015). When all aspects are attained, then graduates are prepared for entering professional practice. A clinical learning environment must evaluate as a negative or positive environment to promote learning and prepare the student to learn how to apply nursing knowledge, nursing skills, patient communication, and professionalization as well as to prepare them for the future workplace (Bigdeli et al., 2015). An effective learning environment improves students' satisfaction, motivation, and self-effectiveness (Chupai, 2016).

Background

There might be educational differences internationally in any nursing programs between 2- to 4-year degree programs with a 40% to 50% practice component, depending on how the preparation of nursing students is for the professional work place (Tomietto et al., 2016). The clinical learning environment includes everything surrounding the student nurses, such as clinical settings as internal factors, and patient, student, clinical supervision, nursing tutor and leadership style as external factors (Henriksen et al., 2012). However, not all student clinical learning environments are similarly appropriate for advancing the student nurses competency in clinical practice. Therefore, additional tools are required to assess the quality of clinical placement (Sundler et al., 2014).

According to previous studies investigating learning conditions for nursing students in clinical practice, the following were identified as the various dimensions which affect a nursing student obtaining the necessary experience in clinical practice, i.e. (1) didactic atmosphere; (2) administrative relationship; (3) premises of nursing care on the ward; (4) management leadership style; and, (5) the role of nurse teacher (Anderson et al., 2014; Gustafson et al., 2015).

A successful learning environment made through a positive pedagogical atmosphere, can result in a conductive interaction with ward staff, encourage students with enough

learning components (Flott & Linden, 2015). When all aspects are attained, then graduates are prepared for entering professional practice. A clinical learning environment must evaluate as a negative or positive environment to promote learning and prepare the student to learn how to apply nursing knowledge, nursing skills, patient communication, and professionalization as well as to prepare them for the future workplace (Bigdeli et al., 2015). An effective learning environment improves students' satisfaction, motivation, and self-effectiveness (Chupai, 2016).

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A successful learning environment made through a positive pedagogical atmosphere, can result in a conductive interaction with ward staff, encourage students with enough

confidence to ask questions, and affirmative learning situation (D'Souza et al., 2015). The means of a supervisory relationship is advice from a clinical supervisor, mentorship, and preceptorship that have a positive interaction with the nursing student to boost learning in nursing education (Chappel, 2016).

The postulates of nursing on the ward are defined as a place where patients receive individualized care, and a place that demonstrates the relationship between students and staff as well as between patients and staff (D'Souza et al., 2015). Management leadership is defined as a ward manager who appreciates her nursing staff and provides a welcoming environment for students (Midgley, 2006). The role of nurse teacher is to guide students to the atmosphere of clinical environment, enabling the integration of theory and practice (Ohman et al., 2016).

The quality of a clinical learning environment is a fundamental element that determines the quality of students' clinical experience (D'Souza et al., 2015) Thus, there exists a requirement for powerful, multilingual tools, with high legitimacy and dependability for assessing the quality of clinical learning environments and improving nursing education, around the world (Vizcaya et al., 2015). Up to now, eight instruments have been developed to estimate the clinical learning environment in the world (Mansutti et al., 2017). Here we explain the three that are more popular:

- a) The Clinical Learning Environment scale (CLE scale) proposed by Dunn and Burnett, was the first instrument and was developed in Australia in 1995 (Dunn & Burnett, 1995). The instrument has focused more on cultural relationships existing in health settings.
- b) The clinical learning environment inventory (CLEI) was developed by Chan. The CLEI scale promoted a thorough in-depth literature review on classroom and other educational learning environments such as colleges and universities (Chan, 2003).

c) The clinical learning environment, supervision, and nurse teacher (CLES+T) instrument that has been used extensively throughout Europe (Papastavrou et al., 2016).

The CLES+T scale was selected for this literature review because the purpose of this tool is to depict the impression of the students about their clinical learning environment. The CLES+T instrument attributes and strengths include: Internal reliability, rationales for psychometric properties, adequate sample size, validation for international comparison, and specific characteristics for clinical environment list (Watson et al., 2014).

Nursing student perception regarding clinical education has been assessed in many different countries, No studies or systematic reviews have been reported assessing this instrument between different countries with different situations. The purpose of this study is to investigate and describe the clinical learning environment, supervision and attendant instructor scale in 10 countries of three different regions all around the world.

Method

Study design and process

This study was carried out by systematic review of the literature by preferable reporting factors for systematic reviews and meta-analysis (PRISMA) guideline (Mikkonen et al., 2016) which investigated the Nursing students' experiences and their feedback to the CLES+T questionnaire in different countries.

PRISMA is a guideline brought out by an international group of experts on intervention and methodology to make strong reporting systematic reviews and meta-analysis (Mansuttia et al., 2017).

Inclusion criteria

Articles were chosen for this study by using predefined process:

- a) Articles which were published between 2002 and 2017.
- b) Articles published in valid journals
- c) Only journals in English language
- d) The target population consisted of nursing students of any age or sex.

CLES+T characteristics

The Clinical Learning Environment and Supervision scale (CLES) was expanded by Saarikoski and Leino-Kilpi in 2002 by literature review with importance on clinical learning environments and the supervisory relationship (Saarikoski et al., 2002). Over the next years, the Clinical Learning Environment, Supervision and Nurse Teacher scale (CLES + T) was emerged on the basis of the reconsider version of CLES, including an additional sub-dimension aimed at evaluating the quality of the nurse-teachers' collaboration with clinical practice (Saarikoski et al., 2008). It is currently the most translated and validated instrument in different countries especially in Europe; Germany, Cyprus, Italy, New Zealand, Norway, Spain, Belgium, Finland, Sweden, The Netherlands, and the UK (Mansutti et al., 2017). The CLES+T instrument consists of 34 items, 5 dimensions were recognized in the psychometric testing: pedagogical atmosphere (9 items) supervisory relationship (8 items) premises of nursing in the ward (4 items) leadership style of the ward (4 items) and the role of nurse teacher (9 items). Each CLES+T items evaluate on a five-Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) (Johansson et al., 2010).

Search strategy

The research strategy was limited to the past 16 years and applied to Medline via PubMed and also Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases. We also used special citation tracking databases (Google scholar and SCOPUS) to identify additional articles and data as needed. The keywords used were: “clinical learning environment”, “nursing student evaluation”, “CLES+T scale”, “psychometric test” and “nurse education”.

Study selection

At first two researchers reviewed all the topics and abstracts and recognized potentially relevant findings and articles, then removed duplications separately; next they discussed together, read every single applicable article in full content and recognized the last reports incorporated into the audit.

Data extraction and synthesis

Thematic or presentative synthesis was used for data analysis, the explanation of the result and to avoid bias. The philosophy of the thematic synthesis is answering the review questions with most efficient knowledge. No specific software was used in thematic synthesis.

Three phases which carried out for presentative synthesis were: (a) Collect original studies, (b) choose relevant topics, (c) create analytical theme. (Mikkonen et al., 2016). To avoid mistakes, the discussion and conclusion parts of each study were reviewed using the research main theory as a guideline. The presentative synthesis was conducted by one researcher.

Data extraction was done by the same researchers considering: author; year of publication; country where the study was performed; year of data collection; study design; sample characteristics; setting (e.g., hospital); instrument validated, type and effect of outcomes; results and limitations (Park & Calamaro, 2013; Conley & Redeker, 2016).

Methodological quality evaluation

The quality of a tool is based on its evaluated psychometric properties and on how these attributes have been investigated (Mokkink et al., 2010). CLES+T is a reliable study scale for quality warranty of clinical learning environment of nursing students and psychometric properties. Interior consistency, unwavering quality (counting test-retest dependability, interrater dependability and intra-rater dependability), estimation mistake, content legitimacy (counting face legitimacy), auxiliary legitimacy, speculations testing (counting joined legitimacy), paradigm legitimacy, and culturally diverse legitimacy, have been approved and globally announced in Germany, Italy, Netherlands, New Zealand, Spain, Sweden and Norway (Saarikoski, 2008).

Selection process

Our search and study selection process (PRISMA fig 1) identified 311 records, of which 111 were duplicates. Out of the remaining 200 records screened by abstract and title, 168 records were excluded because 80 of them did not use CLES+T questionnaire, 68 were not relevant to the aim of this study and 30 records were not focused on nursing students. The remaining 32 full-text articles were assessed for eligibility. Twenty-five records were excluded because they were not relevant to the aim of this review according to the chosen countries. In total 7 studies were incorporated into this review to assess the clinical

Learning environment in 10 different countries including: Germany, Belgium, Norway, Croatia, Nepal and Oman in separate article for each one as well as one article for four Eastern Europe countries (Hungary, Czech Republic, Lithuania and Romania).

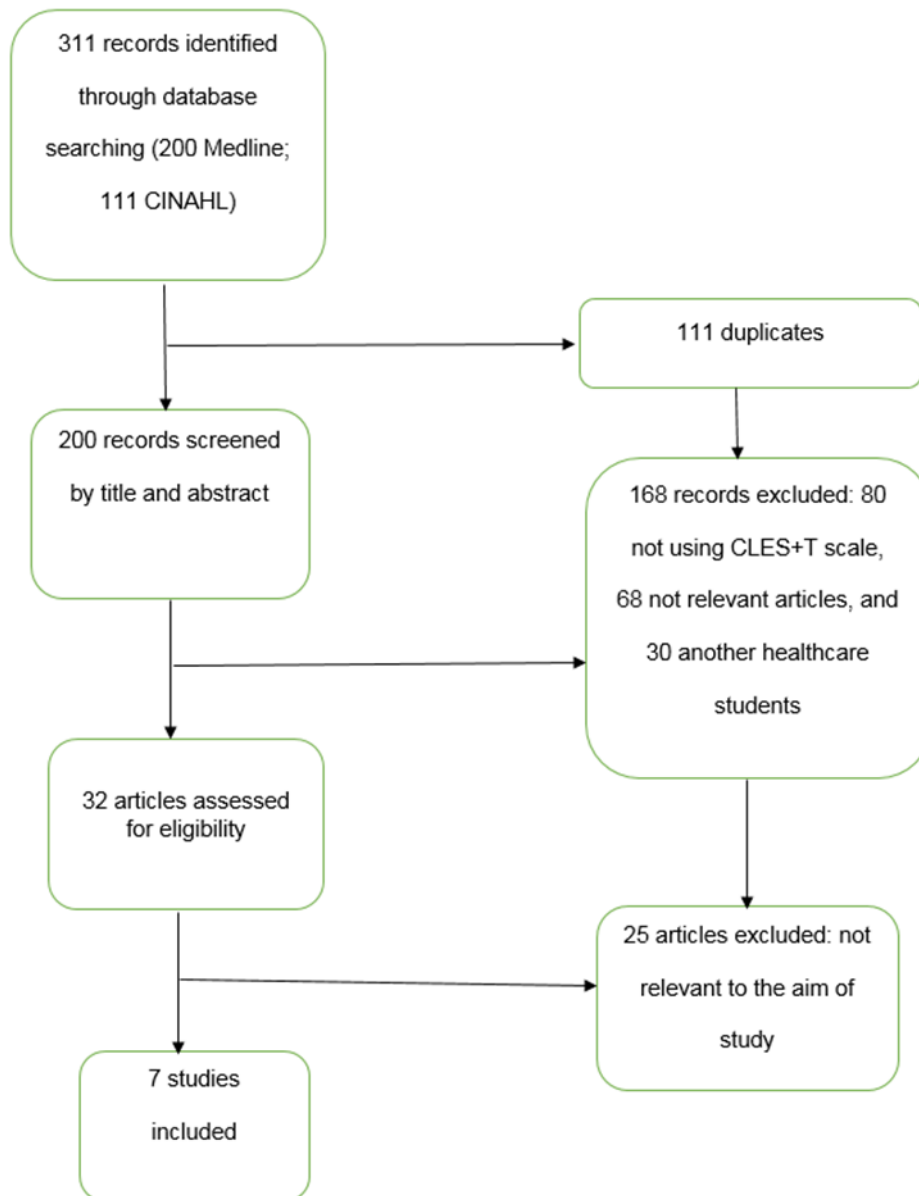


Fig1. Details of literature search and study selection, PRISMA flow dia

Study population

All studies involved nursing students, most of them were female. The research concerned (or included) students from all years of nursing programs and no study involved only 1st year students. In all cases, the validation was performed at the hospital level.

Results

The review includes 7 cross-sectional studies (Henriksen et al., 2012; Witte et al., 2011; Brgan and Hertel, 2013; Antohe et al., 2016; Lovric et al., 2016; Nepal et al., 2016; D'Souza et al., 2015).

Five studies were carried out in Europe (Henriksen et al., 2012; Witte et al., 2011; Brgan & Hertel, 2013; Antohe et al., 2016; Lovric et al., 2016) and two studies were in Asia (Nepal et al., 2016; D'Souza et al., 2015). The objectives, participants, methods, and main findings of each of the 7 studies are summarized in table 1.

Author, year and country of design	Aims	Participants	Methods	Major finding
Bergjan & Hertel, 2013 Germany	To investigate the German version of CLES+T scale for evaluating student nurses	240 German nurses in first and second third year bachelor nurses program	German version of CLES+T questionnaire	The strongest of factor supervisory relationship is

			perception of their clinical placement		
Witte et al., 2011 Belgium	To obtain a reliable and valid Dutch version of the CLES+T that is in the line with the Flemish culture and educational context	768 student nurses in first second and third year of bachelor program	Dutch version of CLES+T questionnaire (cross- sectional survey	The CLES+T is a valid and reliable instrument to evaluate the quality of nursing wards as a learning environment in Flanders. Ward atmosphere and supervisory relationship identified as two important factors	
Henriksen, 2012	To Translate the CLES+T questionnaire	407 student nurses from institutional	Norwegian version of	The instrument has properties suitable for	

Norway	and to evaluate the validity and internal consistency of Norwegian version	practice settings	CLES+T questionnaire	evaluation within a Norwegian context. the role of nurse teacher, supervisory relationship and leadership style of the ward displayed identical items and identified as most important factors
Antohe et al., 2016 Four moderately European unions (Hungary, Czech	To explore the situation of clinical placements for student nurses and their satisfaction with the	418 student nurses in four different countries (Hungary, Czech Republic, the	The quantitative study with CLES+T questionnaire	Students evaluated their clinical learning environment mostly positive and the most important

Republic, Lithuania, and Romania)	learning environment in new member of European Union	Lithuania, and Romania)			factor was supervisory relationship especially when they have individualized supervision
Lovric et al., 2016 Croatia	To translate the CLES+T scale to Croatian language and taste the validity and reliability in practice	136 nurses the practice	student during clinical study	The quantitative study with CLES+T questionnaire	The translated version questionnaire has suitable for the evaluation of clinical practice for nursing students within a Croatian context, the most important factor is supervisory relation ship

Nepal et al., 2016 Nepal	To examine Nepalese nursing students perception of clinical learning environment in Nepal	263 nurses second and fourth year	student in third year	A sectional study with CLES+T questionnaire	cross-	Students were satisfied with the clinical learning environment in overall and the most influential factor was pedagogical atmosphere
D'Souza et al., 2015 Oman	To evaluate of satisfaction and effectiveness of the clinical learning environment among nursing students in Oman	310 nurse randomly selected	student	A sectional descriptive design	cross-	60% of nursing student was satisfied with the clinical learning environment and the most influential factor was supervisory relationship

Table 1 Characteristics of original studies (n=7)

Methodological quality evaluation:

Content validity. The content validity (including face validity) that is considered to be the first step to validate instruments it means which the components within a measurement procedure are relevant and representative of the construct that is used to measure (Johansson et al., 2010). The content validity was estimated positive in the 7 studies as reported in table 2.

Internal consistency. Internal consistency, the psychometric property assessing the relationship among elements, was estimated in 7 studies with quality range excellent. The study demonstrated the almost similar quality of Cronbach's alpha of 0.76-0.96. Only in one study D'Souza et al., the internal consistency was not performed.

Structural validity. The structural validity findings, when reported, were consistent with the construct (dimensions) of the instrument. As reported in Table 2, some authors used Exploratory Factor Analysis (EFA); others used Principal Component Analysis (PCA) or both whilst still others used Confirmatory Factor Analysis in addition to EFA and PCA.

Cross-cultural validity, in all studies, tools were forward- backward- translated used only once.

Author, year and country of design	Content validity	Internal consistency	Structural validity	Cross-cultural validity
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Bergjan & Hertel, 2013	Yes +	0.82-0.96	EFA, PCA	Forward- backward translation	
Germany					
Witte et al., 2011	Yes +	0.80-0.95	EFA	Forward- backward translation	-
Belgium					
Henriksen, 2012	Yes +	0.83-0.96	EFA, CFA PCA	Forward- backward translation	
Norway					
Antohe et al., 2016	Yes +	0.85-0.95	Chi- square	Forward- backward translation	
Four moderately European unions (Hungary, Czech Republic, Lithuania, and Romania)					

Lovric et al., 2016	Yes +	0.77-0.96	EFA	Forward- backward
Croatia				translation
Nepal et al., 2016	Yes +	0.76-0.92	EFA	Forward- backward
Nepal				translation
D'Souza et al., 2015	Yes +	-----	ANOVA	Forward- backward
Oman				translation

Table 2: Instruments evaluating the clinical learning environment quality in different countries

Discussion

Western European countries, after the Bologna declaration, promoted greater harmonization in higher education, nursing students' mobility and variations in implementation (Gurková et al., 2016).

Various eastern European countries joined the European Union during the years 2004-2006. Many fields of life and science have since become more modernized in their thinking after following the admission to the EU. Nursing education has become a university degree in line with European education systems; though with various weaknesses in theoretical and practical nursing still to be addressed (Antohe et al., 2016).

In Asian countries, in contrast, the nursing program has been historically promoted and became a university based diploma many years ago. In these developing countries, the nursing curriculum is divided to almost 50% theory learning and 50% practice for the 3 to 4-years duration of nursing studies (Mansutti et al., 2017).

The main finding of this study is that CLES+T is a valuable tool to evaluate satisfaction with clinical learning and identify key factors in clinical learning environment of student nurses in different countries from distinct geographical, social, and cultural areas. The most important factors across countries appear to be a good atmosphere in the clinical ward together with individualized and thorough supervision.

Clinical environment is a convened organism which consists of many integrated sub systems (Saarikoski et al., 2008). Several evaluation scales have been used to assess nursing students' perception of their clinical placement (Bergjan & Hertel, 2013; Warne et al., 2010). All studies indicated CLES+T instrument was successful and reliable scale in the countries under discussion.

When students start the clinical practice, most of them are newcomers without previous practice background so they need optimal relief, this shows the importance of supervisory relationship in clinical environment (Nepal et al., 2016). The mean of supervisory relationship is varied from a clinical supervisor, mentorship, and preceptorship that have a positive attitude towards supervision and positive interaction with nursing students to improve their learning in nursing education (Chappel, 2016). In Croatia the supervisor has 3 roles as a nurse teacher, mentor and supervisor, so with this multifunctional role they have lack of the time to supervise the students. This causes a negative impact on clinical practice in Croatia (Lovric et al., 2016). There is a different model of supervision: group supervisory approaches and individualized supervisory approaches (Chappel, 2016).

According to previous studies and this review article, despite the quantity of supervision the quality of them is important. Individual supervision is more effective in the learning process than group supervision (Nepal et al., 2016). Based on our findings, the supervisory models are different among countries. In Norway the majority of students are supervised individually (Henriksen et al., 2012); however, in Eastern Europe countries group supervisory model is clearly more common; for example in Romania and Hungary more than 83% of student nurses were administered in a group (Antohe et al., 2016). In Lithuania, more than 41% of students were supervised one-by-one relationship by staff ward (Murauskiene et al., 2013). In Germany and Belgium the supervisory model is completely individual in every wards during the education (Bergjan & Hertel, 2013; Witte et al., 2011). Overall the supervisory relationship was the strongest factor in clinical learning environment as it confirmed in previous studies (Saarikoski et al., 2008; Warne et al., 2010).

The student satisfaction was estimated by using 3 item of CLES+T questionnaire: "is the ward atmosphere regarded as a good learning environment?", "Are you satisfied with supervision you have received?" and "How satisfied were you with the clinical placement as a whole?" (Watson et al., 2014). According to our findings, the highest satisfaction was achieved among students who had individualized supervisor relationship and mostly student nurses of this study were pleased with their clinical arrangement encounters, it was quite similar to what has been found in older EU countries (Warne et al., 2010). A small part of students in Eastern Europe does not have any supervisor during their clinical practice and they were the most unsatisfied students. This study showed the student satisfaction from the clinical learning environment in chosen countries from Asia (Nepal et al., 2016 & D'Souza et al., 2015) is similar to that found in previous investigations from Europe (Saarikoski et al., 2002; Saarikoski et al., 2008; Lovrik et al., 2016; Vizcaya-

Moreno et al., 2015) notwithstanding the distinct nursing instruction systems. Overall, the study shows the CLES+T sub dimensions were effective for the reported student satisfaction from the clinical learning environment.

One of the important findings was the relationship between the length of clinical training and nursing students gratification; for example, in Germany the ratio of clinical training is 54% and the supervisory relationship mostly is one by one, so the student satisfaction was 74% (Bergjan & Hertel, 2013), where as in the Czech Republic, with 50% ratio of clinical placement and group supervisory, satisfaction was lower (Antohe et al., 2016).

It has been reported that student motivation, fulfillment, and nature of learning can be influenced by numerous factors, including the practice setting, learning opportunity, clinical facilities which all of them called pedagogical atmosphere (Williams and West, 2012). In Nepal, the most influential factor for student satisfaction according to CLES+T scale was pedagogical atmosphere to have a positive word for their learning needs. In Belgium it was as much as important the supervisory relationship to constituting a good clinical learning environment. In other countries, this factor was the second or third in importance after supervisory relationship (Nepal et al., 2016; Witte et al., 2011).

Most studies used exploratory factor analysis. They found all items in CLES+T scale have limited discriminating characters which means that there is no high negative or high positive items (Witte et al., 2011), but in a few countries, like Nepal and Croatia, according to the culture and educational system, the CLES+T sub dimensions re-organized and combined together to make the questionnaire reliable (Nepal et al., 2016; Lovric et al., 2016). So it makes the structure of scale differs from the original one but with similar output.

In all studies, the selected sample from clinical placement in hospital settings such as surgical, medical, pediatric, psychiatric, gynecology, geriatric, oncology and social sector units, it is like the sample (n=549) was chosen for the study in Finland by (Saarikoski et al., 2008) there were no specific wards validation by CLES+T scale. The high level of patient turnover and the process of management them cause the nursing staff doesn't have enough time to enhance the relationship with the temporary group of student nurse (Nepal et al., 2016) but ward manager has vital role to create positive and welcoming ward towards student learning process. Unwelcoming environment couldn't support educational process it makes the students center of attention on being acknowledged instead of on learning (Henriksen et al., 2012). At the Bezuidenhout et al. study, the ward manager's role consists of welcoming the students, giving them adequate introduction and advancing inspiration of student in the ward (Papastavrou et al., 2010).

The main interest of the current study is that it represents the first attempt to explore and clarify nursing bachelors' education among countries with different culture and educational training with a same standardized instrument. Our findings confirm CLES+T scale is adjusted to assess gratification of clinical situation of nursing students.

Limitation of the study

All data were gathered from one single or two training institutions so caution is warranted in generalizing the results. There was also limited in geographical areas because the lack of the studies in countries especially out of Europe. All studies were done in hospital setting and there is the lack of information from home care settings and primary health care types of practice.

Implications for nursing and health policy

Personalized supervision, centered on pre-graduate clinical goals achievement, enables students to boost self-confidence, autonomy and clinical reasoning. It is necessary that mentors/preceptors offer students enough quality time to reflect on and practice in the clinical context. The collaboration between academics and clinicians is an indispensable element of nursing training and integrate resources to create an environment capable of achieve the best quality of patient care, sustenance nurses' professional growth and help students to have fruitful clinical experience. Academic and clinical stakeholders must collaborate and plan every step of training to bring nursing students and professionals the best experience in a variety of patient care environments.

Conclusions

Cultural specific and structure of clinical education are affected by the translation of CLES+T in different languages; nevertheless, the results illustrated, in general, that interior consistency and consistency of five sub measurements of CLES+T are high so it supporting legitimacy and dependability of the instrument. Because of these, it could be recognized a trustworthy instrument for national and international studies. Analyze students perceptions related to CLES+T disclose the shortage and potentially demonstrate effective review of clinical practice which could be good to improve bachelors nursing program. There are no significant differences in the mean value related to different topographical territories and different educational system. Also developing a universal instrument to evaluate clinical learning environment internationally, robust investigations in different nations with various cultural and social backgrounds, are required.

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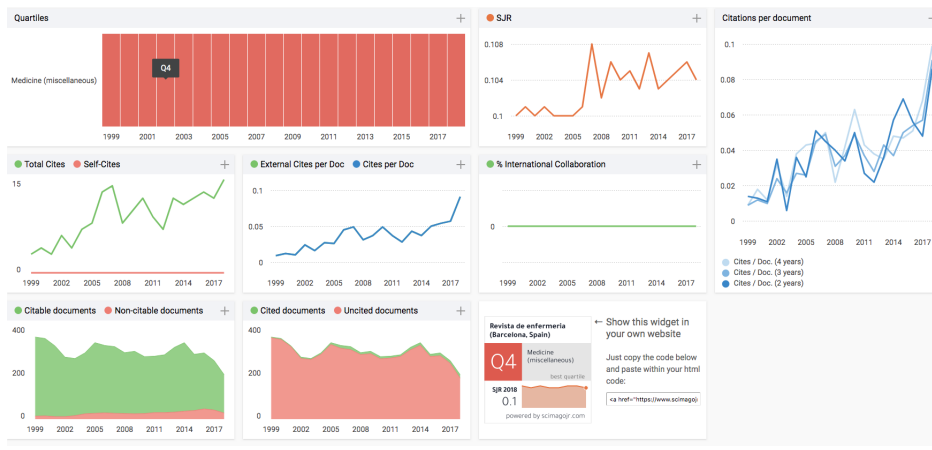
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9.2 Manuscript

Traducción y validación de una escala: a propósito del caso CLES+T (submitted)



ROL Revista de enfermería

SJR

Barcelona, 10 de enero de 2021

A la atención de la Sra. Julia Martínez Saavedra,
Editora de la revista Rol de Enfermería,

Tenemos el placer de remitirle el trabajo titulado “**Traducción y validación de una escala: a propósito del caso CLES+T**” para que considere su publicación en la revista Rol de Enfermería.

Este estudio describe el proceso de traducción y adaptación cultural del cuestionario CLES+T en lengua persa. El CLES+T fue desarrollado para evaluar la percepción del estudiante sobre el entorno del aprendizaje clínico y la supervisión y docencia de éste.

Este estudio detalla la acción de cada uno de los pasos de este proceso metodológico y muestra la consistencia interna de los ítems en el pre-test. La explicación minuciosa de cada uno de los pasos realizada en este artículo puede servir de guía a los lectores para su aplicación en otras validaciones de distintas escalas.

Todos los autores firmantes han participado en la realización de este trabajo y dan su aprobación a la versión definitiva enviada. Los autores declaran no tener ningún conflicto de interés. El trabajo cumple toda la normativa ético-legal vigente, y no se ha enviado ni previamente ni simultáneamente a ninguna otra revista. Para la elaboración del presente artículo se han tenido en cuenta todas las instrucciones para los autores.

Quedamos a la espera de su respuesta, y ante cualquier duda, pueden ponerse en contacto con nosotros.

Atentamente,

Dra. Núria Fabrellas
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Traducción y validación de una escala: a propósito del caso CLES+T.

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Traducción y validación de una escala: a propósito del caso CLES+T.

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RESUMEN

El CLES+T fue desarrollado para evaluar la percepción del estudiante sobre el entorno del aprendizaje clínico y la supervisión y docencia de éste.

El objetivo de este artículo es describir el proceso de traducción y adaptación cultural del cuestionario CLES+T en lengua persa.

Este estudio detalla la acción de cada uno de los pasos de este proceso metodológico y muestra la consistencia interna de los ítems en el pre-test. El valor del alfa de Cronbach en la prueba previa fue de 0,81. La contribución de este estudio consiste en describir la acción de cada proceso de pasos metodológicos y muestra la consistencia interna de los elementos del pre-test.

INTRODUCCIÓN

Los planes docentes del Grado de Enfermería incluyen tanto educación teórica como pedagogía clínica (1). La práctica clínica es una parte sustancial de la educación en enfermería, ya que brinda a los estudiantes la oportunidad de integrar la parte teórica de las aulas a la parte práctica del entorno clínico (2). El sistema educativo debe velar por una educación teórica y un aprendizaje clínico de excelencia, con la finalidad de identificar la oportunidad de desarrollar un entorno positivo para los estudiantes de enfermería (3). La Organización Mundial de la Salud (OMS) acredita la necesidad de cooperación entre los profesionales sanitarios tanto en la educación como en la práctica clínica (4).

La capacidad de práctica clínica y la eficiencia del aprendizaje preparan al estudiante de enfermería para el procedimiento de atención de enfermería, la toma de decisiones y el pensamiento crítico después de graduarse en el entorno laboral real (5).

El entorno de aprendizaje clínico (*clinical learning environment*, CLE) ofrece la oportunidad a cualquier persona de aprender a cuidar del paciente (6). El CLE es todo lo que rodea al estudiantado; es decir, el entorno, el personal, los pacientes, el mentor y el profesor de enfermería (7). Un CLE positivo mejora los resultados de aprendizaje, crea un ambiente de aprendizaje útil a través de una atmósfera pedagógica inspiradora, una buena infraestructura de atención de enfermería, una adecuada orientación de los estudiantes, una duración y continuidad de la práctica clínica y de relaciones interpersonales positivas (8). A pesar de esta aparente armonía, los estudiantes y gestores de enfermería no están completamente satisfechos con los resultados inmediatos de la educación universitaria (9).

Evaluar el entorno de aprendizaje clínico mediante la percepción y la satisfacción de los estudiantes es fundamental para mejorar el cometido educativo (10). Con esta finalidad se han desarrollado diversos instrumentos para evaluar el CLE, tales como: el inventario de aprendizaje clínico, CLEI (11); la escala de inventario de diagnóstico del entorno de aprendizaje clínico, CLESDI (12); la evaluación del estudiante SECEE del entorno de educación clínica (13); la escala de supervisión del entorno de aprendizaje clínico, CLES (14); y posteriormente la escala de supervisión del entorno de aprendizaje clínico modificada (CLES+T). Esta última escala fue desarrollada por los mismos autores de CLES que añadieron una nueva subdimensión (15). La escala CLES+T proporciona un instrumento para monitorear y evaluar la percepción del estudiante del entorno de aprendizaje clínico (16). La escala CLES+T se ha traducido y evaluado en varios países europeos, sin embargo, no existe ningún estudio iraní (17,10). Los estándares en la educación de enfermería difieren entre países, aunque el objetivo común sea el de preparar de manera óptima la próxima generación de enfermeras bien formadas para satisfacer las necesidades emergentes de la sociedad a la que atiende (18). La forma de mejorar la educación en enfermería es evaluar la efectividad de la misma (19).

En Irán, durante la revolución islámica ocurrieron muchos cambios sociales y culturales. Estos cambios tuvieron un efecto en la educación de las enfermeras,

que fueron pasando de un modelo de formación de estudiantes a un modelo académico. El gobierno no prestó atención a la educación de las enfermeras de su país, por lo que, a veces, éstas no estaban preparadas para trabajar en la asistencia (20). En las últimas dos décadas la evaluación de educadores en los programas de educación en enfermería se ha convertido en un tema importante (19). Históricamente, en Irán, la formación enfermera se centró en aspectos prácticos (10). En el año 1935, los graduados de estas escuelas fueron llamados asistentes médicos (21). Desde entonces, la educación en enfermería ha experimentado muchos cambios relacionados con los valores sociales y el cuidado enfermero (19).

En Irán existen diferentes tipos de educación en enfermería clasificados como:

- *Komak Behyar*: asistente de enfermería, generalmente se ocupa de satisfacer las necesidades básicas de las personas realizando tareas básicas de enfermería. La duración de los estudios es de dos a seis meses bajo la supervisión de una enfermera.
- *Behyar*: asistente de enfermería, capaz de dispensar una atención de cuidados básicos de forma autónoma y una atención enfermera más desarrollada bajo la supervisión de una enfermera registrada. Los estudios duran un año después de obtener el diploma de la escuela secundaria.
- Enfermeras tituladas (RN): se educan en la universidad durante cuatro años con una formación teórica y práctica. Para acceder a estos estudios es necesario realizar un examen de ingreso al estudiantado proveniente de bachillerato.
- Maestría en enfermería: es un programa clínico y presencial de tres años que cubre alrededor de 43 créditos obligatorios y opcionales en total, para preparar enfermeras calificadas que puedan actuar como educadoras de enfermería, realizar investigación clínica y organizar los entornos de prestación de atención médica.
- Programa de doctorado. La base del primer programa de doctorado en enfermería en Irán se estableció en 1995. Estos programas tienen una duración de 4-5 años y contienen 52 créditos, incluidos 20 créditos para tesis (22).

A pesar de los distintos programas, los estudiantes no están satisfechos con el aprendizaje de las habilidades y los cuidados para el desarrollo de la enfermería (23). Durante la formación enfermera se debe prestar especial atención a la

calidad de la educación y el aprendizaje de los estudiantes. Para poder evaluar la formación de éstos existen distintas escalas que evalúan la calidad y la eficacia de los esfuerzos educativos (24). Uno de los instrumentos que evalúan el aprendizaje es la Escala de Evaluación de Ambiente y Supervisión de Aprendizaje Clínico (CLES), que incorpora cuatro elementos: 1) el ambiente pedagógico, 2) el estilo de liderazgo, 3) las premisas de enfermería y 4) la relación de supervisión. El desarrollo psicométrico de la escala CLES se comparó y probó primero en Finlandia y luego en ocho países europeos (14,16). La escala CLES no abordaba el impacto del docente de enfermería, por lo que una quinta dimensión fue añadida en el 2008 como resultado de discusiones teóricas, revisiones de la escala y estudios empíricos. La escala resultante se denominó CLES+T (15,16).

El instrumento CLES+T consta de 34 ítems definidos en 5 dimensiones que se identifican en la prueba psicométrica: 1/ambiente pedagógico (9 ítems) 2/relación de supervisión (8 ítems), 3/premisas de enfermería en la sala (4 ítems), 4/estilo de liderazgo de la sala (4 ítems) y 5/ el papel del docente de enfermería (9 ítems) (15). Posteriormente para conocer la satisfacción de los estudiantes, en 2009, se agregó una subescala de satisfacción de los estudiantes al cuestionario. Por lo que, finalmente, se puede confirmar que el cuestionario consta de 35 ítems en total divididos en seis subescalas. Cada elemento se evalúa según un formato Likert de 1=totalmente en desacuerdo; 2=parcialmente en desacuerdo; 3=ni de acuerdo ni en desacuerdo; 4=parcialmente de acuerdo y 5=totalmente de acuerdo (28).

Actualmente existen 23 versiones lingüísticas de las escalas CLES y/o CLES+T, y se ha demostrado que es una herramienta válida y confiable entre diferentes muestras internacionales (25,26). Las propiedades del instrumento CLES+T incluyen confiabilidad interna, fundamentos de las propiedades psicométricas, tamaño de muestra adecuado, validación para comparación internacional y características específicas para el inventario del entorno clínico (27). El propósito general de este estudio es describir las fases para la traducción de la escala CLES+T en idioma persa.

METODOLOGÍA: Procedimientos de traducción y adaptación del instrumento.

Población

La selección de la población se realizó según el grupo que debía intervenir. Para la traducción se seleccionaron personas conocedoras del idioma persa y del inglés con una edad mayor de 25 años y con dos años mínimo de experiencia laboral. Para el panel de expertos, debían tener más de 15 años de experiencia laboral en educación y práctica de enfermería en la Universidad Iraní. Para la prueba piloto, estudiantes de enfermería iraníes que cursaran estudios de 2º a 4º año independientemente de su edad, género y etnia.

Proceso de adaptación

Para los procedimientos de traducción y adaptación, se siguió el método de validación transcultural que incluye cinco pasos (28, 29). A continuación se describen estos pasos para la traducción y adaptación de la escala CLES+T:

Primer paso:

Traducción directa de la versión inglesa del cuestionario CLES+T al persa. La versión iraní de CLES+T se tradujo y retrotradujo siguiendo un proceso de pasos específico (30). Se seleccionaron cuatro traductores independientes que fuesen nativos del idioma persa y dominasen el inglés. Los cuatro conocían el objetivo principal del estudio y eran especialistas en educación y práctica enfermera en universidades iraníes con más de quince años de experiencia laboral.

Segundo paso:

Consenso de la versión traducida persa. El investigador se reunió con los traductores y se compararon todos los ítems de las cuatro versiones traducidas con la versión original en inglés. Posteriormente el investigador creó la instancia única de la versión persa.

Tercer paso:

Evaluación de la versión persa y consensuada por un panel de expertos. Fueron cuatro expertos con más de quince años de experiencia laboral en educación universitaria y práctica enfermera en universidades iraníes. Se evaluaron elementos semánticos, culturales y conceptuales con la finalidad de asegurar que el significado de la versión traducida es en mismo que en la versión original. El comité de expertos revisó las preguntas teniendo en cuenta la validez de contenido. Con el fin de evaluar la aceptabilidad y comprensión del instrumento por parte de la población objetivo.

Cuarto paso:

Traducción inversa realizada por un traductor independiente de gran fluidez en el habla inglesa y persa. Este traductor no conocía el objetivo de la investigación y el instrumento original. Posteriormente, el investigador comparó esta versión en inglés con el instrumento original para verificar las diferencias semánticas y logró el consenso sobre el término equivalente de la versión original.

Quinto paso:

Análisis semántico de los ítems traducidos a 10 estudiantes de enfermería. Los estudiantes debían evaluar la comprensión de todos los ítems del cuestionario. Posteriormente se evaluó la calidad del instrumento seleccionando a 35 estudiantes de enfermería iraníes que respondieron el cuestionario para que se pudiese comprobar su comprensión y aceptación cultural de cada ítem. Al mismo tiempo, en este pre-test se evaluó la consistencia interna y la confiabilidad del cuestionario.

RESULTADOS Y DISCUSIÓN

Validez de contenido

Los expertos en práctica clínica de enfermería, que realizaron y reconsideraron la traducción, corroboraron que la versión iraní del cuestionario CLES+T constaba en un 80% de elementos relevantes (culturales, idiomáticos y semánticos) importantes en la práctica clínica de enfermería. Las preguntas demográficas se reconsideraron debido a la cultura iraní y el panel de expertos

selección siete. La terminología iraní de educación en enfermería es diferente de la terminología utilizada en el CLES+T original. Debido a la infraestructura de la práctica clínica de enfermería en la universidad iraní, los estudiantes semejaron los términos: "profesora de enfermería" como "mentor", y el término de "gerente de sala" como "enfermera jefe". Se sugirió cambiar la terminología después de discutirlo con el investigador.

Análisis semántico

El análisis semántico del cuestionario para evaluar su validez se probó de forma piloto entre 10 estudiantes universitarios que finalizaban la práctica clínica como parte de su plan de estudios. Al final, la versión iraní de CLES+T consta de 33 en lugar de 34 elementos ya que dos elementos fueron considerados idénticos ("hubo suficientes situaciones de aprendizaje significativas en la sala" y "las situaciones de aprendizaje eran multidimensionales en términos de contenido"). Esta fusión fue fruto de que los estudiantes fueron incapaces de diferenciar el significado. Los participantes recibieron información antes de completar el cuestionario; asimismo se les informó sobre el objetivo del estudio y sobre el anonimato de sus respuestas. Se les aseguró que la participación era voluntaria y que la no participación no tendría consecuencias para su futura formación.

Fiabilidad

La confiabilidad del cuestionario para medir la interrelación y coherencia de los ítems se realizó a partir de una muestra de 35 estudiantes. Todos los datos se transcribieron en el programa SPSS para calcular el alfa de Cronbach. El coeficiente de alfa de Cronbach mide la correlación entre los ítems, se considera una correlación suficiente cuando el valor es 0,70 o superior (valor entre 0 y 1). El alfa de Cronbach general de los 33 ítems fue 0,813 y osciló entre 0,704 y 0,890 para todos los factores identificados en la estructura teórica de CLES+T. El alfa de Cronbach más alto se encontró en la subcategoría "relación de supervisión" con un valor de 0,89. Las subcategorías restantes oscilaron entre 0,70 y 0,86. Posteriormente, se evaluó la semántica idiomática, cultural y conceptual de los ítems y en caso de desacuerdo entre versiones se analizó por parte de los expertos y se propusieron sugerencias para lograr una mejor comprensión del instrumento (30). La aceptación definitiva de los cambios se

produjo cuando el 80% de los miembros del panel de expertos estuvo de acuerdo con la sugerencia. En este paso se evaluó la validez y el contenido del instrumento y al final se estableció un acuerdo para la versión persa.

El concepto de supervisor clínico en los estudios de enfermería de la universidad en Irán, se identifica como una ayuda para el desarrollo de la orientación clínica (31). El concepto de supervisión se utiliza como un sentido general dentro del cuestionario, es un sistema potente que puede fomentar, apoyar y mejorar la práctica profesional de los estudiantes de enfermería (32). En la mayoría de las universidades de Irán, la supervisión la realiza un mentor contratado por la universidad de enfermería; ya que debe tener una orientación pedagógica, una formación científica y un conocimiento del contenido del plan de estudios para apoyar y evaluar al estudiante de enfermería (10). Esta supervisión se puede realizar de forma individual o grupal; aunque en Irán, la mayoría de las universidades siguen la supervisión grupal.

El término profesor de enfermería se refiere al papel de un profesor de enfermería calificado empleado por de la universidad. El papel de esta persona es enseñar la parte teórica a los estudiantes de enfermería y prepararlos para las prácticas (15). El panel de expertos y el investigador confirmaron que la versión persa de CLES+T tiene una validez aceptable y es adecuada y relevante para los estudiantes de enfermería iraníes. El resultado de la evaluación de validez aparente, consistencia interna y confiabilidad mostró que la versión iraní del instrumento CLES+T es adecuada para evaluar el entorno de aprendizaje clínico para estudiantes de enfermería en la práctica hospitalaria tal como se confirma en el estudio de Ohman (33) y en la revisión sistemática realizada por Soemantri et al. Que mostró que el instrumento CLES+T es la escala más adecuada para la formación médica de pregrado, posgrado en medicina y enfermería (30).

Nuestro estudio muestra que la escala CLES+T es comprensible, útil y tuvo una alta consistencia y confiabilidad interna en el estudiantado de enfermería iraní, por lo que el CLES+T puede considerarse una herramienta prometedora para la evaluación del entorno de aprendizaje de enfermería.

Como limitación principal, al no realizarse un análisis estadístico comparativo podría dar lugar a que los resultados sucediesen por casualidad; por lo que se debería hacer un análisis factorial confirmatorio.

CONCLUSIÓN

La escala CLES+T es una herramienta prometedora para la evaluación del entorno de aprendizaje de enfermería en Irán. La evaluación de la percepción y satisfacción de los estudiantes sobre la experiencia clínica es necesaria para el profesorado, ya que, la retroalimentación de los estudiantes ayuda a mejorar la eficiencia educativa (34).

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