ORIGINAL ARTICLE

Adaptation of software with the nursing process for innovation units

Adaptação de software com o processo de enfermagem para unidades de internação

Adaptación de software con el proceso de enfermería para unidades de internación

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ABSTRACT

Objective: To adapt data collection of the Information System software with the nursing process in Intensive Therapy for use in medical and surgical clinic units. **Methods:** A descriptive study developed in three stages. The first consisted of team training; in the second, the software was applied in clinical practice with 100 patients; and in the third, we analyzed the modifications to be done. **Results:** There was inter-observer agreement of 91%, followed by application of the software in 100 patients. In the "patient registration" module, it was suggested the exclusion of one item, inclusion of six and modification of four of them. In the anamnesis screens, no items were flagged to be deleted; 26 inclusions and 7 changes were proposed. In the physical examination screens, it was suggested the exclusion of 31 items, inclusion of 26 and modification of 27. **Conclusion:** Modifying information systems and going through stages methodologically constructed and implemented was important.
Descriptors: Nursing Processes; Validation of Computer Programs; Informatics in Nursing; Software; Nursing.

RESUMO

Objetivo: adaptar a etapa de coleta de dados do software Sistema de Informação com o Processo de Enfermagem em Terapia Intensiva para uso em unidades de clínica médica e cirúrgica. **Métodos:** estudo descritivo desenvolvido em três etapas. A primeira consistiu na capacitação da equipe, na segunda o software foi aplicado na prática clínica com 100 pacientes e na terceira analisaram-se as modificações a serem realizadas. **Resultados:** obteve-se concordância inter-observador de 91%, seguido por aplicação do software em 100 pacientes. No módulo cadastro dos pacientes foi sugerida a exclusão de um item, incluídos seis e modificados quatro. Nas telas de Anamnese, nenhum item foi sinalizado para ser excluído; foram propostas 26 inclusões e sete alterações. Nas telas do exame físico foi sugerida a exclusão de 31 itens, a inclusão de 26 e 27 modificações. **Conclusão:** Observa-se a importância de modificar sistemas de informação, perpassando por etapas metodologicamente construídas e implementadas.
Descritores: Processos de Enfermagem; Validação de Programas de Computador; Informática em Enfermagem; Software; Enfermagem.

RESUMEN

Objetivo: adaptar la etapa de recolección de datos del *software* Sistema de Información con el Proceso de Enfermería en Terapia Intensiva para uso en unidades de clínica médica y quirúrgica. **Métodos:** estudio descriptivo desarrollado en tres etapas. La primera consistió en la capacitación del equipo; la segunda, en la aplicación del *software* a la práctica clínica con 100 pacientes y; la tercera, en el análisis de las modificaciones que se deben llevar a cabo. **Resultados:** se obtuvo concordancia interobservador del 91 %, seguida de aplicación del *software* a 100 pacientes. En el módulo de registro de los pacientes, se sugirió la exclusión de un ítem, la inclusión de seis ítems y la modificación de cuatro. En las pantallas de Anamnesis, no se señaló ningún ítem que excluir; se propusieron 26 inclusiones y siete modificaciones. En las pantallas del examen físico se sugirió la exclusión de 31 ítems, la inclusión de 26 y la modificación de 27. **Conclusión:** se observa la importancia de modificar sistemas de información, avanzando por etapas metodológicamente construidas e implementadas.
Descriptores: Procesos de Enfermería; Validación de Programas Informáticos; Informática en Enfermería; Software; Enfermería.

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INTRODUCTION

The *Conselho Federal de Enfermagem* (COFEN - Federal Nursing Council) aims to develop a holistic, individualized approach that can contemplate the specificities of human beings through Resolution 358/09. This Resolution is recommended to be systematized and based on a theoretical support and that the nursing process (NP) stages be implemented in all environments that require this professional category[1].

NP is a private activity of nurses and includes five stages: research, nursing diagnosis (ND), planning, implementation and evaluation of care. With its application, it is recognized the critical thinking used by nurses in identifying the needs of patients, and determining the care prescribed to minimize them/solve them in a way that the expected results can be reached[2].

Deploying NP in health care facilities can favor holistic patient care. This implementation ensures that nursing interventions are directed to the needs of the individual and not to the disease, having the nurse as protagonist in the care process, through determination and performance of independent and collaborative care[3]. However, it should be emphasized that NP must be based on a nursing theory in order to avoid it being reduced to a methodological way of grouping information unrelated to the subject's subjectivity[4].

One of the most used theoretical references in the Brazilian reality is the Basic Human Needs theory (BHNs) by Wanda de Aguiar Horta. This theory is in line with what is advocated by public health policies regarding the need to provide humanized care, allowing patient evaluation as an indivisible whole. In order to understand the human being as a target person of care, within which to evaluate and provide assistance to meet the psychobiological (PBN), psychosocial (PSN) and psycho-spiritual (PSPN) needs, one should use the basic premises of theory[5].

However, in the care practice, it is evident that nurses have difficulties in operationalizing all NP stages, and that software use for their operationalization has been indicated[6]. In the information age, computerized systems become an indispensable work tool for health professionals, not only in relation to care, but also in relation to care management[7].

However, although it is recognized that NP should be linked to a theoretical framework, a descriptive study that analyzed the NP use applied to software showed a lack of work on the development of software based on a theoretical framework[8]. In order to fill this gap and seek to favor the applicability of NP in professional practice, a software called *Sistema de Informação com o Processo de Enfermagem em Terapia Intensiva* (SIPETi - Information System with the Nursing Process in Intensive Therapy). It is based on the BHNs theory and contains the five NP stages, patient rating scales and health indicators[5].

SIPETi was more advantageous when compared to the manual register as to the fact that it is more precise in the performance of NP stages; for allowing a better understanding of the interrelationship between NP stages; and have warnings and reminders that minimize the registration of invalid data. In addition, the system facilitates data collection to evaluate the service from its use, as well as has help subsidies that can be accessed in case of doubts, providing more adequate resources for the application of NP in nursing practice[6].

When evaluating 23 studies that composed the sample of an integrative review, it was verified that only 2 articles reported software use for medical and surgical clinic[8]. One of the studies describes the *Sistema de Informação em Enfermagem* (SISEnf - Nursing Information System) applied at the Lauro Wanderley University Hospital Medical Clinic of *Universidade Federal da Paraíba* (UFPB). The software contemplates the care and management dimension, as well as NP stages, adopting the NANDA-International terminology (NANDA-I) for ND[9]. The second article describes the *Sistema de Documentação Eletrônica do Processo de Enfermagem da Universidade de São Paulo* (PROCEnf-USP - Electronic Documentation System of the Nursing Process of the University of São Paulo)[10]. The software's care dimension includes NP stages. The NANDA-I, Nursing Interventions Classification (NIC) and Nursing Outcomes Classification (NOC) terminologies are adopted to standardize the language used in the diagnostic stages, interventions and outcomes, respectively. However, it is not described if the system has a management interface. Both studies do not inform the use of theoretical framework for the construction of systems.

A system that has the theoretical support of Wanda de Aguiar Horta's BHNs theory includes the care and management dimensions and contemplates all NP stages. The system can and should be adapted to innovation units in order to allow the increase of the gains obtained with its use to patients in need of nursing care in these sectors. It should be emphasized that, for data collection, patient registration and nursing history modules are used.

OBJECTIVE

This study aims to adapt the data collection stage of the SIPETi software to use in medical and surgical clinic units.

METHOD

Ethical aspects

This study complied with the National Health Council guidelines, Resolution 466/2012. The project was approved by the Committee of Ethics in Research with Human Beings (CAAE - *Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration: 45113815.7.0000.5153), and all participants signed the Informed Consent Form.

Design, place of study and period

It is a descriptive study developed in partnership by researchers from research groups of *Universidade Federal de Viçosa* and *Universidade Federal de Minas Gerais*.

The study was carried out in units of medical and surgical clinic, feminine and masculine, of a philanthropic teaching hospital of a municipality in the forest area of Minas Gerais. The two clinics where the system was used add up to 35 beds destined to the care, in the majority, of patients from medical clinic and general surgery. The care in these clinics is performed by the *Sistema Único de Saúde* (SUS – Brazilian Unified Health System).

Population or sample; inclusion and exclusion criteria

The study population consisted of patients admitted to the medical and surgical clinics from January 9 to March 17, 2017. The study included patients who were admitted to the units and were able to participate in the study when researchers performed data collection. Patients who were submitted to examinations, invasive procedures and those who left the unit due to discharge, death or transfer were excluded. During the data collection period, 271 patients were admitted to the study site. However, 100 patients met the inclusion criteria and were the sample of this study.

Study protocol

The creation of SIPETi was the result of joint work of two research nurses and two system analysts. The language used was CSharp (C #), for having Microsoft technical support, portability, compatibility with other operating systems and encryption. The software has three sessions, the first one for the registration of nursing professionals and patients; the second is aimed at the NP stages; and the third allows access to the database and system parameters[11].

In SIPETi, the nursing history module is subdivided into anamnesis and physical examination. Definitions of terms in this module are provided in a help link in order to be used as an information and clarification tool. It is emphasized that, when the patient presents some evidence that is not constant in the system, it is possible to include the data in free text[11].

In order to propose the SIPETi adaptation to medical and surgical clinic units, the methodology used involved three stages. A training for software use; one of inter-observer reliability to check the training of researchers in the establishment of ND; and a third, descriptive, with notes of changes and adequacies in the SIPETi contents in order to improve it for the incorporation of data essential to perform care for patients in medical and surgical clinics.

Thus, the first stage consisted in enabling two researchers to use the SIPETi software. Initially, the thesis "*Construção e avaliação da aplicabilidade de um* software *com o processo de enfermagem em uma Unidade de Terapia Intensiva de adultos*" was read, which describes the elaboration of the developed system[5]. Then, inter-observer training[12] was conducted with the objective of calibrating the researchers, so that they could describe the same phenomenon observed, with the greatest possible similarity. Later, researchers separately entered information on anamnesis and on physical examination of validated clinical cases presented in the literature[13], considered as a template for this stage of the study. From this information, they selected in the software the priority ND for each case.

The second stage of the study comprised the software application in a tablet in clinical practice. The software was used on the first day of admission, followed by daily follow-up of the patient by two researchers until discharge, transference or death. As a source of secondary information, the medical records, examinations and companions were used.

The third stage consisted of software analysis, screen-to-screen, to identify the necessary modifications. This analysis was carried out in a discussion group composed of researchers who carried out the second stage along with two professors, doctors in nursing, who have worked with the system since its inception. At this stage, software fields that were not filled at any time in the field study were identified as a result of being related to the specificities of patients admitted to Intensive Care Units (ICUs). These fields have been deleted from the system. In addition, researchers identified data that should be inserted and/or modified in the system in order to provide its use in clinical and surgical patient innovation units.

Analysis of results, and statistics

In the first stage, agreement index was analyzed among researchers who would participate in the second stage of the study. To do this, after insertion of the data related to the case studies used in this stage, agreement was established between them by comparing diagnoses, outcomes and nursing prescriptions. Agreement index was verified through the formula[12]: $IC = (NA/NA + ND) \times 100$, where NA is number of agreements; and ND, number of disagreements. After three training cycles, the agreement rate was reached above 90%[14], meaning that the two researchers are adequate and aligned. Thus, both were considered trained and with the necessary skills to initiate data collection once the records were considered reliable[12].

In the second stage of patient data insertion in the software by researchers, simple descriptive statistics were applied, using absolute and relative frequencies.

In the third stage, the descriptive analysis of the software screens was carried out. At that time, items not applicable to SIPETi's medical and surgical clinic population were excluded, as well as the data that should be inserted to contemplate the population; and also the items that should be modified regarding the nomenclature for updating.

RESULTS

During the three rounds of training for SIPETi use, there was a growing agreement between these three sessions of 45%, 78% and 91%, in the establishment of ND for the patients from the case studies. As the agreement index obtained in the third training was 91%, greater than 90%, researchers were considered fit to use the software.

Among the 100 patients seen by researchers, it was verified that in the clinic for the admission of female patients, 57 (57%) patients were registered; and in the male part, 43 patients (43%).

Their age ranged from 11 to 94 years, with the majority of patients (62%) being between 18 and 59 years of age; followed by elderly people aged 60 or over (33%). Due to the need for admission, 55% were clinical patients and 45% were surgical. As for the cause of admission, they were hospitalized due to gastrointestinal (26%), musculoskeletal (20%), cardiovascular (11%), respiratory (11%), reproductive/genital (10%), tegumentary %), kidney (7%), endocrine/metabolic (3%), neurological (1%) and immunological (1%) problems. Of all patients, 88 (88%) were discharged, 9 (9%) were transferred to other sectors or hospitals and 3% died.

The software use on a tablet enabled the nursing consultation at the bedside, with the time initially spent filling the system was 2 hours per patient and, when acquiring familiarity with the screens, it was possible to complete it in 20 minutes.

After data collection, the items needed to be excluded, included, maintained or modified for the adaptation of the SIPETi to the use in innovation units (Table 1) were identified in each screen (third stage of the study).

During the software's adaptation stage, specific items evaluated in the anamnesis and physical examination of critical patients, such as those related to intracranial pressure monitoring (ICP), cerebral perfusion pressure (CPP), central venous pressure (CVP), intra-arterial pressure (IAP), intra-aortic balloon (IAB), among others, were excluded. While, for patients hospitalized in medical-surgical clinics, it was necessary to include items such as social name, occupation, marital status, labor relationship, secondary diagnosis, life habits (passive smoking and use of illicit substances), motility, history of falls, among others. In Chart 1, BHNs are presented per screen of the system, as well as description of the items to be excluded, included and modified, for adaptation and use of the software in medical and surgical clinic units.

Table 1 – Number of items excluded, included or modified in the SIPETI screen, Viçosa, Minas Gerais, Brazil, 2017

SCREEN	ITENS	EXCLUDED		INCLUDED		MODIFIED	
		n	%	n	%	n	%
Data/Registration	20	1	5	6	30	4	20
Anamnese							
Screen 1	15	-	-	10	66.66	2	13.33
Screen 2	14	-	-	8	57.14	3	21.42
Screen 3	14	-	-	7	50	2	14.28
Screen 4	11	-	-	1	9.09	-	-
Physical Examination							
Screen 1	12	4	33.33	1	8.33	-	-
Screen 2	15	2	13.33	1	6.66	12	80
Screen 3	19	2	10.52	4	21.05	-	-
Screen 4	13	2	15.38	-	-	-	-
Screen 5	21	5	23.8	5	23.8	2	9.52
Screen 6	15	2	13.33	4	26.66	3	20
Screen 7	12	5	41.66	3	25	2	16.66
Screen 8	7	-	-	3	42.85	-	-
Screen 9	12	2	16.66	5	41.66	8	66.66
Screen 10	12	7	58.33	-	-	-	-
Total	212	32	15.09	58	27.35	38	17.92

Note: Chart 1 presents a detailed description of each item in the screens.

Chart 1 – Items excluded, included or modified on SIPETi screens, Viçosa, Minas Gerais, Brazil, 2018

SIPETi'S SCREEN	EXCLUDED	INCLUDED	MODIFIED
Registration Screen Nothing to say.	International Classification of Diseases (ICD10).	Social name; Occupation; Labor link; Marital status; Reason for admission and secondary diagnosis.	- Form of insertion of "date of birth" and "nationality"; - Added options to the items "Organic system as cause of admission" and "Provenance".
ANAMNESIS			
Screen 1 Environment; Therapy; Regulation (immunological, neurological); Learning; Emotional security.	Nothing to say.	- Options to select "previous diseases diagnosed by health professionals according to the organic systems"; - Space to describe "admissions and previous surgeries with date and reason"; - Item to describe "family history related to the disease"; - Inserted in "lifestyle choices: "Passive smoker" and "Use of illicit drugs" - Space to report "Forgetfulness related to the use of medications", as well as "Who administers the medication" and "What knowledge of the patient and family about the indication of medicines"; - Added item on "Vaccination".	- "Alcoholism" replaced by "Alcohol consumption" with selection options; - Inserted window in "Medications in use" that allows to enter the name and posology.
Screen 2 Communication; Time and space orientation; Sensory perception; Sleep and Rest; Hydration; Oxygenation; Physical integrity; Regulation (vascular); Cutaneous-mucosal integrity.	Nothing to say.	- Including information about the state of awakening "Wake up rested", "Present sleep during the activities of the day" and "There is reported to present unusual behavior during sleep"; - In "Nutrition and Water Intake", added items: "Food Preference", "Water Intake" and "Choking or Coughing with Feeding/Water Intake"; - In "Oxygen therapy", included item related to "previous difficulty breathing"; - Item that investigates the "History of edema".	- Added options to the item "Has trouble sleeping"; - Term "Oxygen therapy" replaced by "Oxygenation and vascular regulation"; - In the item "Prior self-care deficit - Oral hygiene", the "no" and "yes" options were replaced by "Not independent", "Totally dependent" and "Partially dependent".
Screen 3 Disposal; Motility/Locomotion; Body mechanics; Exercise and physical activity; Recreation; Leisure; Creativity; Learning; Self-esteem/self-confidence/self-respect; Self-image; Self-realization; Freedom/Participation; Acceptance; Attention; Space.	Nothing to say.	- Space to describe "Characteristics of urine" and "Characteristics of feces"; - Fecal incontinence with "start date" option; - Included in the topic "Motility/previous locomotion" items regarding the "History of falls"; "Ambulation aid"; "March" and "Consciousness regarding its limitation".	Insert options in the items "Prior urinary relief" and "What he/she likes to do".

To be continued

Chart 1

Screen 4 Gregarious/love; Sexuality; Environment/shelter; PSPN (religious or theological/ethical or philosophy of life).	Nothing to say.	- Inserted item for "Preventive examinations" in day, with option of the last date and observations.	Nothing to say.
PHYSICAL EXAMINATION			
Screen 1 Regulation (neurological); Physical integrity; Communication; Guidance in time and space; Emotional security/love/acceptance.	- Ramsay Scale; - Cranial assistive devices; - Intracranial pressure (ICP); - Cerebral perfusion pressure (CPP);	Richmond Agitation Sedation Scale (RASS)	Nothing to say.
Screen 2 Sleep and rest; Perception (olfactory, visual, auditory, tactile, gustatory, painful); Thermal regulation.	SwanGanz and Combitube catheters excluded from the item "Assistive devices in the spine segment and cervical region".	- In the item referring to "Pain", inserted in "type" the option "throbbing" and field to describe observations; - Included in the field "Mouth" the option "absence of teeth".	- Modified the items "Face", "Hair", "Eyelids", "Eyeball", "Visual acuity", "Ears", "Nose", "Paranasal sinuses", "Mouth" and "Cervical region", with options of "without commitment" and "commitment - Cite".
Screen 3 Cutaneomucous integrity; Body mechanics; Regulation (cell growth, hydrosaline, electrolyte).	- Excluding the option "Absence of teeth" in the item "Ability to perform oral hygiene"; - Excluded SwanGanz Catheter from Chest Assistive Devices.	- "Type of bath" added to the options "sprinkler" and "bed"; - Addition of "Characteristics", "Frequency" and "Quantity" to the item "Vomit".	Nothing to say.
Screen 4 Oxygenation	- Venous Oxygen Saturation (SVO2); - Capnography (ETCO2)	Nothing to say.	Nothing to say.
Screen 5 Regulation (vascular); Motility.	- Central venous pressure (CVP); - Intra-arterial pressure (IAP); - SwanGanz; - Disposal (IAB); - Field related to Arrhythmias.	- Field to select "Checked pulses" as well as "Symmetry"; - In the item "Heart ausculta", added the options "hyphononic sounds" and "hyperfonéticas"; - In the item "Abdominal Percussion", added the option "increased"; - Inserted item referring to "Sudden decompression abdomen maneuver".	- for "Pacemaker", changed the options for "absent/present and local"; - Term "Timpanism" replaced by "Percussion".
Screen 6 Disposal	- In the item "Dialysis", excluding type information, others, beginning, ending and volume installed; - Excluded item "Water Balance".	- Included field to evaluate "Odor of urine" and "Goldflam's sign"; - In the item "Intestinal disposal", included in aspect the options "melena" and "live blood"; - Included item to describe the "feces color".	The term "McBurney Sign" replaced with "Blumberg Sign" and the "present" option was changed to "positive" and "absent" to "negative".
Screen 7 Sexuality; Exercise and physical activity / locomotion; Body mechanics; Regulation (vascular); Physical integrity.	IAB, double lumen, IAP, SwanGanz, and venous dissection venous catheter excluded from the item "Assistive Devices in the Limbs."	- Added in the item "Genitalia" the option "normal vaginal discharge of the menstrual cycle"; - Included field to describe the "Mobility" with assistance (crutch, cane, walker and others), as well as the "Use of orthoses and prostheses".	- Modified the system of evaluation of the edema in the members for the system of crosses (+/4+); - The term "Pressure ulcer" has been replaced by "Pressure injury".
Screen 8 Therapy	Nothing to say.	- Added field for "Medication dosage" in Therapy: Intermittent medications; - Added fields for "Route of administration" and "dosage" in "Therapy: Antimicrobials, antifungals or antivirals".	Nothing to say.

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Chart 1 (concluded)

Screen 9 (Hormonal) regulation; Therapy.	Excluding the items "Multiple specific interventions in the ICU" and "outside the ICU".	- In the item "Insulinotherapy", inserted the options "regular" or "NPH" to select; - Inserted space for "date of completion" in "Laboratory examinations" as well as field for laboratory results of "bilirubin", "urine" and "feces".	- The term "insulin bolus" or "ml/h" is replaced by "units"; - Changed unit of measurement for the exams: "Calcium", "Magnesium", "Sodium", "Potassium", "Platelets", "Urea" and "Creatinine".
Screen 10 Gregarious/freedom/participation/love/acceptance; Self-esteem/self-confidence/self-respect; Recreation/leisure; Therapy/Learning; Self-realization; Space; Regulation (cell growth); Environment; Psychospiritual Needs.	Excluding the options "IAB", "double lumen catheter", "IAP monitoring catheter", "ICP monitoring catheter", "SwanGanz catheter", "ETT" and "TCT" in the item "Accidental loss of assistive devices".	Nothing to say.	Nothing to say.

DISCUSSION

During SIPETi's adaptation, changes in data were necessary. On the registration screen, we highlight the inclusion of social name, established by Decree 8,727, dated April 28, 2016. The social name, which in its third article exposes that records of information systems, registers, programs, services, charts, forms, records and similar of organs and entities of the Federal public administration, autarchic and foundational, should contain the "social name" field highlighted with the civil name, which will be used only for internal administrative purposes[15].

The screens corresponding to the anamnesis included an item referring to the use of illicit drugs. About 246 million people worldwide use psychoactive substances, which corresponds to the overall prevalence of 5.2% in 2013[16]. This is a multifactorial public health problem involving biological, psychic, social and cultural dimensions; and constitutes a challenge for the implementation of integrated and comprehensive policies. Thus, it is important that the nurse in an innovative unit also assess the patient about the use of drugs, since this may interfere in the therapy[16].

With regard to the scales present in the SIPETi database, it is considered that the Richmond Agitation Sedation Scale (RASS) should be included on the physical examination screens, which accurately covers the level of agitation and anxiety. This is configured as advantage over the Ramsay Scale. In addition, such a scale is one of the most valid, applicable and reliable evaluation instruments to measure the quality and depth of sedation in critically ill adult patients. It is also amenable to use in clinical practice and in protocols, in order to minimize the negative impacts of excessive sedation and agitation[17].

In the anamnesis module, the items that make up the Katz Index of Independence in Activities of Daily Living are present. It evaluates the performance of the elderly in activities of daily living. In the proposal to adapt the system to medical and surgical clinic units, items that require responses related to previous activities, developed outside the hospital environment, were connected to questions present in the module in order to generate more reliable results[18].

In order to cover adverse events, such as the fall, it was also suggested the inclusion in the software of the Morse Falls Risk Scale (1989). Fall is an event that may have numerous risk factors involved, such as age over 65 years, changes in level of consciousness, bladder and/or intestinal incontinence, neurological and cardiovascular diseases, use of psychoactive medications, history of previous falls, altered gait, functional disability, cognitive deficit[19]. Conditions, these, identified during data collection performed with patients registered in the study.

Study says that falls can have as consequence the increase of the time of admission and the cost of the treatment, besides causing discomfort to the patient[19]. Thus, it is essential that the nurse be able to identify the potential factors for the risk of falling, tracing interventions so that this potential diagnosis does not evolve into a current problem (diagnosis with a focus on the problem).

In order to classify the degree of dependence of nursing care, the proposal to insert into the Fugulin Scale system was included[20]. It is intended to determine the degree of dependence of a patient in relation to the care of the nursing team, aiming to establish the time spent in direct and indirect care to meet the patients' biopsychological needs. The Patient Classification System (PCS) assists the nurses in the decision-making process regarding the allocation of human resources, monitoring of productivity and costs of nursing care, reflecting on the organization of services and planning of nursing care[20].

Thus, as a suggestion for future researches, there was incorporation of the proposals described through this study in the process of modifications and the consequent creation of new software here called *Sistema de Informação com o Processo de Enfermagem em Unidades de Clínica Médica e Cirúrgica* (SIPECLi – Informaion System with the Nursing Process in Clinical and Surgical Clinical Units). It is worth noting that this system is tested in order to evaluate its functionality, reliability, usability and efficiency, as well as to enable its improvement and availability for public use, both in assistance and in teaching.

Study limitations

It was not possible to carry out the clinical validation of the changes proposed in the software for adaptation to the medical-surgical clinical unit.

Contributions to the fields of nursing, health or public policy

Among several computerized nursing systems used in clinical practice, SIPECLi presents as a differential the fact of having a theoretical support. Wanda Horta's Basic Human Needs theory used in software is adapted to the Brazilian reality and facilitates the identification of the individuals' most affected needs, allowing the nursing team to focus their care actions through the elaboration of NDs and interventions. In addition, SIPECLi integrates the NANDA-I and NIC taxonomies, standardizing the language used in the profession.

It is also emphasized that the software has a care and management interface that allows the registration of the care provided. This fact generates professional support, as well as enables the monitoring of daily evolution throughout admission of patients. Its use allows a reduction in the time dedicated to bureaucratic activities, such as registers in the medical records, and optimized time management in direct patient care. Its management interface has indicators that contribute to decision-making and care analysis, as well as accumulating a database for future research. Thus, this software will contribute positively to the provision of nursing care for the patients admitted to the medical-surgical clinic.

CONCLUSION

By carrying out the training of researchers to use the software, it was possible to establish an inter-observer reliability standard, guaranteeing an adequate domain for the practical application of the software.

Software use in medical and surgical clinics, male and female (n=100), allowed us to experience practical situations that contributed to changes in system in order to meet the specificities of this population.

During the analysis, the screen in the patient registration module was suggested to exclude one (5%) item, including six (30%) items and proposals four (20%) modifications. In the 4 screens that compose the anamnesis, no item was flagged to be excluded; were proposed 26 (48.14%) inclusions and 7 (12.96%) alterations. In the 10 screens of physical examination, the exclusion of 31 (22.46%) items and the inclusion of 26 (18.84%) items were suggested, as well as 27 (19.56%) modifications were proposed.

Given the reality presented, it is considered that information systems and softwares based on nursing theories - as well as the use of terminologies and classification systems - are innovative, necessary and available resources, although still little explored and disseminated. These systems can collaborate in the improvement and strengthening of the nursing care provided, as well as in the assurance of continuity linked to patient safety to be cared for.

During data collection, it was evident the difference and the need to organize the nursing care in a systematized way through NP, and also how much software can positively assist in this work. It is observed the importance of systems to be adequately adapted to meet patients' specificities by clinical areas.

Subsequently, it is intended to change the system platform based on the needs presented in this study; and then to establish links between NDs and interventions with those included in the first NP stage, with a view to achieving the expected results/assessment of care.

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