








Self-care nursing interventions: A qualitative study into electronic health records' contents

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Abstract

Aims: This study aims to (1) analyse all self-care-related interventions Portuguese nurses documented, (2) determine potential issues that may impair semantic interoperability and (3) propose a new set of interventions representing nursing actions regarding self-care that may integrate any HER application.

Background: As populations age and chronic diseases increase, self-care concerns rise. Individuals who seek healthcare, regardless of context, need prompt access to accurate health information. Healthcare professionals need to understand the information in all places where care is provided, creating the need for semantic interoperability within electronic health records.

Methods: A qualitative descriptive and exploratory study was conducted in two phases: (1) a content analysis of nursing interventions e-documentation and (2) a focus group with fifteen registered nurses exploring latent criteria or insights gleaned from the findings of content analysis. The COREQ statement was used to guide research reporting.

Results: We extracted 1529 nursing intervention sentences from the electronic health records and created 209 intervention categories. We identified the main issues with semantic interoperability in nursing intervention identification.

Conclusion: According to the findings, nurses cooperate with clients, offering physical aid and encouraging them to overcome functional limitations to self-care tasks hampered by their conditions.

Implications for nursing policy and health policy: This article provides evidence to warn policy makers against decisions to use locally customised electronic health records, as well as evidence on the importance of policy promoting the adoption of a nursing ontology for electronic health records. And, as a result, the harmonisation and effective provision of high-quality nursing care and the reduction of healthcare costs across nations.

KEYWORDS

Activities of daily living, electronic health records, focus groups, models, nurses, nursing, practice patterns, standardising nursing terminology



INTRODUCTION

Population ageing poses a significant health and socioeconomic challenge worldwide (Rudnicka et al., 2020). Approximately two-thirds of those who reach late age, require assistance with activities of daily living, such as eating, bathing and moving around (World Health Organization, 2022). Such requirements may emerge as a result of a sudden incident or develop gradually throughout an individual's life. Health and social care systems of many countries are currently unable to offer adequate services and support to older adults who require long term care (World Health Organization, 2022).

Nurses, roles in enhancing and maintaining the health of older adults is critical (International Council of Nurses, 2022). When an individual's health needs exceed what is available within families and communities, nurses can become their primary caretakers when admitted to aged care or hospital services (International Council of Nurses, 2022).

For nurses to provide appropriate care to all recipients, documentation of clinical data and digital supports are indispensable to the future adequacy of healthcare (European Commission, 2022). Health data exchange and use shift the paradigm away from treatment responses to crisis, towards prediction and prevention of health breakdown (Hendolin, 2021). Nursing care in Portugal has, for over 20 years, used electronic health records (EHRs) using the International Classification of Nursing Practice® (ICNP®) to document nursing care (Amherdt & Morais, 2018). The International Council of Nurses (ICN) relies on the ICNP® nomenclature to facilitate worldwide representation of the nursing field of practice in order to promote evidence-based quality care (International Council of Nurses, n.d.).

The European Commission, on 3 May 2022, submitted its legislative proposal to establish a European Health Data Space (EHDS) providing its citizens with secure access to their electronic health data by establishing a digital health market. These papers cover a wide range of topics related to ensuring health data interoperability (Stellmach et al., 2022). The Center for Research and Development in Nursing Information Systems (CIDESI) from the Nursing School of Porto (ESEP) was tasked by the Health Ministry to review existing nursing diagnoses and interventions from all healthcare institutions that use the public information system to assure semantic interoperability (Paiva et al., 2014). The self-care contents were included in this project as a crucial domain of nursing care.

BACKGROUND

Ageing societies, the rise in life expectancy and, consequentially, chronic diseases contribute to a growing interest in people's ability to care for themselves throughout their lives (Imaginário et al., 2020). This learned and purposeful behaviour is critical to one's life, health and well-being (Orem, 1995). The terms 'activities of daily life', 'basic nursing

care activities' or even 'fundamentals of care' are often used to describe self-care (Carpenito-Moyet, 2021; Kitson et al., 2013). Orem (1995) refers to self-care requisites as circumstances that lead people's self-care goals. Self-care requisites are organised into three broad categories: universal, health deviation, and developmental. This study will focus exclusively on universal self-care requisites considered universally applicable across the life cycle, regardless of age or stage of development, and associated with vital processes that maintain the human being's structure, function and internal and external conditions (Orem, 1995).

A self-care deficit occurs when an individual's capacity for self-care declines (Orem, 1995). Individuals with a self-care deficit cannot care for themselves on their own and hence need assistance. As a result, a dependency condition develops, requiring nursing care. Orem (1995) identifies five possible modes of assistance: (1) do for, (2) guiding others, (3) offer physical or psychological support, and (4) establish and maintain an optimal environment for personal growth and (5) teaching. Nurses should prioritise actions that meet the patient's goals, in the care plan. Therefore, a nursing intervention is an action performed by a nurse, based on clinical judgement and expertise, to improve patient/client outcomes (Butcher et al., 2018). However, there is limited evidence for effective nursing interventions to assist patients with daily living activities (Richards et al., 2018). Essential nursing care activities that remain undone, are identified as missed nursing care activities (Chaboyer et al., 2021). Missed nursing care in older patients may result in an iatrogenic cascade, such as pneumonia, pressure injury, urinary tract infection and delirium, which are prevalent. These four complications have been grouped as a nurse-sensitive indicator of care for older patients (Chaboyer et al., 2021), leading to a critical need for adequate documentation of clinical nursing interventions and care outcomes for nurses to reflect upon (De Groot et al., 2022).

Contemporary society is dependent on data, and digitalisation is thought to be crucial for the future of healthcare (European Commission, 2022). Digital health provides healthcare services via information and communication technologies to promote health and well-being. The goal of digital health is to make healthcare safer, efficient, accessible and appropriate for everyone (Benis et al., 2022). To obtain interoperable health information, nursing care documentation systems must be standardised (National Coordinator for Health Information Technology, 2017). Semantic interoperability refers to the requirement for diverse computer systems to interchange content and meaning in order to reliably and effectively offer high-quality healthcare services while lowering healthcare expenditures across nations (Gavrilov et al., 2019; Harrington, 2019). The integration and exchange of information across health organisations and system providers is currently problematic. Each institution often has its own internal data management ecosystem and storage of electronic patient records. Semantic interoperability eliminates data silos and keeps data independent of supplier systems, allowing

information to be exchanged between organisations (De Mello et al., 2022).

Portugal leads eHealth implementation in Europe (EuroNews & The European Commission, 2022). Nurses in Portugal have been e-documenting nursing diagnoses and interventions since 2005 through the EHR (SAPE® – *Sistema de Apoio à Prática de Enfermagem*) provided by the Ministry of Health of Portugal. Nurses moved from descriptive text records, to selecting from a core list of nursing diagnoses and interventions sentences capable of representing the scope of nursing care. In January 2013, 93.1% of Portuguese public hospitals utilised EHRs that incorporated ICNP®, and 74.1% utilised SAPE®. In primary health care, 91.0% of Portugal's units utilised the SAPE® (Cardoso & Sousa, 2015) information system based upon the ISO 18104 structure (International Organization for Standardization, 2003) reference terminology model for nursing interventions. This terminology model defines a nursing action as a deliberate act performed on a target through an action. As a result, a descriptor for action and another for a target are used to describe a nursing intervention. SAPE® accommodated each unit and institution's unique nursing care needs (Pereira & Silva, 2010). Institutions served by SAPE® developed nursing diagnoses, interventions and associations between them. As a result, there were a variety of nursing interventions sentences, raising concerns about documentation accuracy and semantic interoperability. These nursing intervention sentences associate primitive concepts of ICNP® according to ISO 18104, and nurses select from a list of potential interventions to prescribe and document.

The ideal order or grouping of nursing interventions for optimal patient outcomes has not yet been determined for basic nursing care (Englebright et al., 2014). Identification of suitable self-care interventions for best patient outcomes can be facilitated through an examination of Portuguese nursing e-documentation. Furthermore, the substantial usage of EHR and e-documentation analysis by Portuguese nurses can aid in identifying semantic interoperability issues with current nursing intervention sentences.

Aim of the study

This study's aims are to (1) analyse all self-care-related interventions Portuguese nurses documented, (2) determine potential issues that may impair semantic interoperability and (3) propose a new set of interventions representing nursing actions regarding self-care that may integrate any EHR application.

METHODS

Research design

This research follows the work started by Queirós et al. (2021), who reviewed the nursing diagnoses associated with self-care.

It is a qualitative, descriptive and exploratory study conducted in two phases: (1) a content analysis of nursing interventions e-documentation and (2) a focus group to explore latent criteria or insights gleaned from the content analysis findings.

The research source material consisted of self-care nurse intervention sentences from every Portuguese institution (hospital and primary care) that used SAPE® in 2013. It was provided to CIDESI by the Portuguese Ministry of Health. Due to the significance of self-care in all nursing settings, all SAPE® nursing interventions addressing self-care were included. Consolidated criteria for Reporting Qualitative research (Tong et al., 2007) were used to optimise the reporting quality of the current study.

Ethical considerations

This study complies with the Declaration of Taipei (World Medical Association, 2016). In this line, the researchers accessed data previously anonymised. It conforms to the Declaration of Helsinki (World Medical Association, 2013). Participants in the focus groups were informed of the study's aims and objectives prior to focus groups. All privacy-related rights were maintained. Transcripts safeguarded the confidentiality of individuals. The first author had access to the audiotapes, while the other authors had access to the transcripts. The project was approved by the Ethics Committee of the Nursing School of Porto (no. 200/2020) (Queirós et al., 2021).

Phase 1. Content analysis

Three stages were included as recommended in Bardin's guidelines (2018): pre-analysis, material exploration and treatment of results, and conclusions and interpretations.

Data collection

The following criteria were observed to retrieve the material from SAPE® records:

- All nursing interventions involving the terms 'self-care: use of toilet' or 'self-care: physical activity' or 'sitting' or 'transferring' or 'getting up' or 'walking with aid' or 'moving in a wheelchair' or 'positioning' or 'eating' or 'self-care: drinking' or 'self-care: clothing' or 'dressing or undressing' or 'washing' or 'self-care: personal arrangement' or 'self-care: hygiene' or 'self-care: bath';
- Criteria for exclusion: nursing interventions that contain the terms 'parent' or 'mother' or 'father' or 'newborn' or 'infant'. Furthermore, all nursing interventions with a target related to health deviation self-care requisites, such as 'Treating hypoglycemia', and nursing interventions



where target was developmental self-care requisites, e.g., 'Motivating early breastfeeding behaviour' were also excluded. Moreover, interventions targeting a psychological process or related to this focus were excluded. Equally, all nursing interventions involving ostomies were not considered since Silva et al. (2016) is researching this subject.

During the pre-analysis phase, coding principles implemented were as follows:

- ICNP® was used as the terminology (International Council of Nurses, 2013);
- Primitive concepts were employed, primarily from the action axis;
- The terms (action or target) matched those in the ICNP® (International Council of Nurses, 2013) have been kept. As an example, 'feeding';
- The terms identified that had different expressions were updated using similar terms at the ICNP® (International Council of Nurses, 2013). As an example, 'Moving in a Wheelchair' would be (re)placed with 'Wheelchair use';
- Square brackets were used for terms that did not match any similar one on the ICNP® (International Council of Nurses, 2013), such as [nasogastric tube];
- The ISO 18104 (International Organization for Standardization, 2003) was used as a reference model for nursing interventions. As a result, a descriptor for action and another for a target are required to represent a nursing intervention. Action is the mechanism through which an intentional service is supplied to a care receiver. A target is something that the nursing action affects or something that gives the action its content. Other descriptors from the reference terminology model, such as means (device), route (epidural), site (body part) and caregiver (individual), might be employed.

Data analysis

After a thorough examination of the retrieved nursing intervention sentences, new criteria emerged, resulting in the exclusion of:

- Nursing interventions which targeted 'self-care: physical activity', as well as those targeted 'self-care: sleep-rest behaviour' to restrict the scope of the study;
- Nursing interventions sentences whose content was too broad or ambiguous, e.g., 'Supervising [patient activity]', as they may translate various definitions and even different or contradictory interpretations, e.g., 'Setting Up Article of Clothing';
- Sentences with no clinical utility or, in some cases, without a specified target to justify their scope, e.g., 'Stimulating Patient' or 'Coordinating Patient Act';

- Medical prescriptions were excluded. Sentences indicating medical prescriptions, e.g., 'Administering food by infusion device', 'Performing Nutrition Therapy';
- All nursing interventions in which the target was a body process or related to this focus, e.g., 'Surveying active joint movement of the knee'.

Throughout the exploratory phase, the analysis was subjected to formerly established criteria (Bardin, 2018). By using a mixed procedure, each nursing intervention was classified as a context unit and coded. To ensure the process's reliability, two external PhD nursing experts, experienced in content analysis, assessed the new categorisation.

Phase 2. Focus group

A focus group was formed to investigate latent criteria or insights gleaned from content analysis findings that illustrate semantic interoperability issues. The methodological concepts that guided the focus group facilitation were based on Krueger and Casey's (2014) recommendations.

Sample and setting

Participants inclusion criteria: previous knowledge of clinical reasoning and ICNP® research and registered nurse with PhD or master's degrees. Emails were sent to a purposive sample of 15 registered nurses. An experienced nurse, PhD candidate in nursing science, led the focus group, which took place in a higher education institution.

Data collection

The focus group meeting opened with the study's objectives. To stimulate discussion among participants, the facilitator asked: 'Does each term used in categorising nursing interventions have a specific meaning?' and 'Are these terms clinically relevant in self-care interventions?' Participants needed a 240-min audiotaped meeting to fully discuss the questions, and the researcher took notes during the session.

Data analysis

Two data coders coded the results of the focus group. Computerised data analysis techniques were not used to preserve the richness of the data. Saturation occurred when no further data were discovered during the analysis that allowed for category development. It was the point in the data coding process that no new codes were added (Saunders et al., 2018). Inter-coder reliability was achieved and tested using the ICNP axis coding tree and the ISO standard, consistent with the approach taken by Queirós et al. (2021).

TABLE 1 Corpus of analysis by focus

Focus	<i>n</i>
Self-turning	152
Self-feeding	135
Self-hygiene	126
Self-transferring	116
Self-dressing or undressing	109
Walking	97
Standing	92
Self-toileting	89
Self-washing	77
Self-bathing	75
Walking using device	75
Self-grooming	50
Drinking	35
Wheelchair use	35
Sitting	19
Total	1282

FINDINGS

Phase 1. Content analysis

We identified 1529 nursing interventions from SAPE® and excluded 247 sentences from the material retrieved (Supplementary Table S1). Our corpus of analysis included the remaining 1282 nursing interventions (Table 1). By using previously defined encoding rules, we obtained categories for 659 nursing interventions on the self-care domain (Supplementary Table S2).

Phase 2. Focus group and content analysis revisited

At the focus group meeting, we presented our findings from content analysis with possible ICNP® definitions of the included terms. We sought insights about the content analysis findings that focused on the meaning of the nursing interventions, particularly those that highlighted semantic interoperability issues. We also discussed the differences in terminology used to represent actions and targets, as well as their relevance to self-care tasks.

The findings of the focus group session provided additional criteria for exclusion and encoding:

- Activity intrinsic to the intervention(s)/good practice were excluded. Sentences that specified activities related to the performance and good practice of nursing interventions, e.g., 'Organising Material for Self-Bathing', 'Planning Walking' and 'Praising Self-hygiene' (Supplementary Table S3).
- Interventions that did not have clinical utility and represented an intention or goal were excluded. Particular

sentences, such as 'Promoting Standing', have been found to underpin a purpose connected to a nursing theory and the goals of nursing care rather than an action (Supplementary Table S3).

- Nursing interventions centred on targets indirectly linked to a deficit in self-care were excluded, e.g., 'Instructing positioning technique of [anti-spastic pattern]'; 'Positioning patient optimising respiration' (Supplementary Table S3).
- Nursing interventions with terms from the 'Determining' axis were excluded. These interventions are concerned mainly with data collecting for a diagnostic purpose (diagnostic activities) or for evaluating the impact of nursing interventions, for example, 'Surveying walking' and 'Determining device for walking' (Supplementary Table S3).
- An encoding rule emerged stating that action targets such as 'client' or 'individual' should be omitted from the intervention. Despite the diverse classified terms, it is critical to understand whether there is a need to specify the nursing intervention through the beneficiary. The possibility of discriminating against the recipient of care enables diverse nursing interventions that, though equivalent, are considered different, such as 'Feeding the person', 'Feeding the elder' and 'Feeding the adolescent'. Therefore, the nursing intervention is restricted to a term of the action axis, e.g., 'Feeding' or 'Positioning'.
- To encode as walking all interventions with a wandering target. Wandering is a colloquial term for walking in Portuguese; however, the different terms have different meanings in ICNP®. Therefore, walking was found to be the term that best fits the self-care framework.
- To encode all interventions 'Teaching about [adaptative strategies] to *target*' or 'Teaching about *target*' as 'Instructing to *target*'. The discussion arose about this kind of intervention 'Teaching about [adaptative strategies] to self-feeding' and 'Teaching about self-feeding', for example.
- Participants in the focus group emphasised the importance of prescribing a teaching intervention to give information rather than demonstrating how to act or execute self-care. 'Instructing' is the action that suits this context/content – ways of doing or performing. The term 'Teaching' must be applied to interventions that involve highly structured and organised content.
- To encode all interventions 'Training technique for *target*' as 'Training *target*'. The participants sustained the differences between interventions, such as 'Training technique for getting dressed or undressed' and 'Training to getting dressed or undressed'. No differences were found.

One of the barriers to semantic interoperability was conceptual duplication between categorisation frameworks for nursing intervention, resulting in ambiguity. Additionally, this issue led to a variance in the granularity and comprehensiveness of nursing interventions.

The focus group session generated a wider set of rules for encoding (a) aggregation of nursing intervention sentences and (b) balance between comprehensiveness of the therapeutic intention and the type of action in the nursing



TABLE 2 Final nursing interventions by focus

Focus	Nursing interventions
Self-feeding	Assisting in food preparation
	Assisting in self-feeding
	Assisting in self-feeding through a tube
	Feeding using device
	Feeding using syringe
	Instructing to food preparation
	Instructing to self-feeding
	Instructing to self-feeding through a gastrointestinal tube
	Instructing to self-feeding using device
	Promoting self-efficacy for self-feeding
	Providing device for self-feeding
	Teaching about food preparation
	Teaching about the device for self-feeding
	Training to self-feeding through a gastrointestinal tube
	Training to self-feeding through a tube
	Training to self-feeding using device
	Assisting in self-feeding through [nasogastric tube]
	Feeding the [patient]
	Feeding the [patient] through [nasogastric tube]
	Feeding the [patient] through [nasogastric tube] using an infusion device
	Feeding the [patient] through [orogastric tube]
	Feeding the [patient] through a gastrointestinal tube
	Instructing to self-feeding through [nasogastric tube]
	Instructing to self-feeding through [orogastric tube]
	Promoting the [meaning about care regime] para self-feeding
	Training to self-feeding through [nasogastric tube]
	Self-transferring
Assisting in self-transferring to the bed	
Assisting in self-transferring to the commode	
Assisting in self-transferring to the wheelchair	
Instructing to self-transferring	
Instructing to self-transferring for the wheelchair	
Instructing to self-transferring using a device	
Promoting self-efficacy for self-transferring	
Providing device for self-transferring	
Teaching about the device for self-transferring	
Training to self-transferring	
Training to self-transferring for the wheelchair	
Training to self-transferring using a device	
Transferring from bed using a device	
Transferring to bed	
Transferring to the commode	

(Continues)

TABLE 2 (Continued)

Focus	Nursing interventions
Self-washing	Transferring to the wheelchair
	Transferring using device
	Assisting in self-transferring to the [chair]
	Promoting the [meaning] about the use of a device for self-transferring
	Transferring the [patient]
	Transferring to [chair]
	Transferring to the [stretcher]
	Assisting in self-washing
	Assisting in washing a body region
	Assisting in washing the denture
	Assisting in washing the eyes
	Assisting in washing the hands
	Assisting in washing the head region
	Assisting in washing the oral cavity
	Assisting in washing the perineal region
	Brushing the denture
	Cleaning nose
	Instructing to wash the oral cavity
	Promoting the self-efficacy for self-washing
	Training to wash the hands
Training to wash the oral cavity	
Self-hygiene	Washing the back
	Washing the body region
	Washing the face
	Washing the hands
	Washing the head region
	Washing the oral cavity
	Washing the perineal region
	Assisting in self-hygiene
	Assisting in self-hygiene no shower
	Assisting in self-hygiene on bed
	Hygiene on bed
	Hygiene on shower
	Instructing to self-hygiene
	Instructing to self-hygiene das mamas
	Instructing to self-hygiene do perineal region
	Instructing to self-hygiene using a device
	Promoting autonomy in self-hygiene
Promoting self-efficacy for self-hygiene	
Providing a device for self-hygiene	
Teaching about the device for self-hygiene	
Training to self-hygiene	
Training to self-hygiene using a device	
Hygiene on [bathtub]	
Hygiene of the [patient]	

(Continues)



TABLE 2 (Continued)

Focus	Nursing interventions
Self-grooming	Promoting the [meaning] about the use of a device for self-hygiene
	Assisting in combing the hair
	Assisting in grooming nail foot
	Assisting in grooming nail hands
	Assisting in grooming the nail
	Assisting in self-grooming
	Assisting in shaving
	Grooming nail foot
	Grooming nail hands
	Instructing to grooming the nail
	Instructing to self-grooming
	Instructing to self-grooming using a device
	Promoting self-efficacy for self-grooming
	Providing device for self-grooming
	Teaching about the device for self-grooming
Standing	Training to self-grooming
	Training to self-grooming using a device
	Combing the [patient]
	Grooming the [patient]
	Assisting in standing
	Elevating arm
	Elevating body region
	Elevating leg
	Instructing to stand using a device
	Instructing to standing
	Instructing to standing for wheelchair
	Promoting self-efficacy for standing
	Providing device for standing
	Teaching about the device for standing
	Training to stand from the wheelchair
Self-toileting	Training to stand using a device
	Training to standing
	Elevating [1st get up] the [patient]
	Elevating the [patient]
	Promoting the [meaning about care regime] for standing
	Assisting in self-toileting
	Assisting in self-toileting using a bedpan
	Assisting in self-toileting using bedpan or urine bottle
	Assisting in self-toileting using urine bottle
	Instructing to self-toileting
	Instructing to self-toileting using a device
	Promoting autonomy in self-toileting
	Promoting self-efficacy for self-toileting
	Providing bedpan

(Continues)

TABLE 2 (Continued)

Focus	Nursing interventions
Self-bathing	Providing commode
	Providing device for self-toileting
	Providing urine bottle
	Teaching about the device for self-toileting
	Training to self-toileting
	Training to self-toileting using a device
	Promoting [meaning] about the use of a device for self-toileting
	Assisting in self-bathing
	Assisting in self-bathing on bed
	Assisting in self-bathing on shower
	Bathing on bed
	Bathing on commode
	Bathing on shower
	Bathing patient
	Instructing to self-bathing
Self-turning	Promoting self-efficacy for self-bathing
	Providing device for self-bathing
	Teaching about the device for self-bathing
	Training to self-bathing
	Training to self-bathing on shower
	Training to self-bathing using a device
	Bathing on [bathtub stretcher]
	Assisting in self-turning
	Instructing to self-turning
	Instructing to self-turning using a device
	Positioning amputation stump
	Positioning body region
	Positioning foot
	Positioning for meal
	Positioning leg
Self-dressing or undressing	Promoting self-efficacy for self-turning
	Providing device for self-turning
	Providing pillow
	Teaching about the device for self-turning
	Training to self-turning
	Training to self-turning using a device
	Positioning the [patient]
	Assisting in self-dressing or undressing
	Instructing to self-dressing or undressing
	Instructing to self-dressing or undressing using a device
	Promoting self-efficacy for self-dressing or undressing
	Providing device for self-dressing or undressing
	Teaching about the device for self-dressing or undressing
	undressing

(Continues)



TABLE 2 (Continued)

Focus	Nursing interventions
	Training to self-dressing or undressing
	Training to self-dressing or undressing using a device
	Dressing the [patient]
	Promoting [meaning] about the use of a device for self-dressing or undressing
	Promoting the [meaning about care regime] for self-dressing or undressing
	Taking off clothes [patient]
	Teaching to suit [clothing]
Drinking	Assisting in drinking
	Instructing to drink using a device
	Instructing to drinking
	Promoting self-efficacy for drinking
	Providing device for drinking
	Teaching about the device for drinking
	Training to drink using a device
	Training to drinking
Walking using device	Assisting in walking using a device
	Instructing to walk using a device
	Promoting self-efficacy for walking using a device
	Providing device for walking using device
	Teaching about the device for walking using a device
	Training to walk using a device
Walking	Assisting in walking
	Instructing to walking
	Promoting self-efficacy for walking
	Training to walking

intervention sentence. Following the focus group discussion, we analysed our corpus and used the amended encoding criteria, yielding 209 nursing intervention categories (Table 2). Figure 1 depicts the procedure we used as well as a summary of the results.

DISCUSSION

This study proposes a new set of nursing intervention sentences within the context of patient self-care based on the documentation of Portuguese nurses on the EHR and the input of focus group members. Semantic dispersion and redundancy of action and target terms explained the difference in focus group content analysis results. Thus, target and specification variances were reduced. We also grouped the types of actions based on the focus group participants' contributions.

Our data reveal that different terms used for target interventions and their specifications, produced several nursing interventions that underpin similar meanings. Furthermore, various sentences addressed the same intervention/procedure,

exposing a failure to balance granularity with a clinical value. The granularity of nurse intervention sentences may potentially be detrimental to EHR users (Moore et al., 2020). The sentences were quite detailed, which may have been used to highlight the unique duties performed by a subset of nurses. However, these singularities make it difficult to construct health indicators and evaluate the extent to which nurses contribute to patients' self-care.

Our findings indicate a lack of agreement on the descriptors used in nursing intervention sentences. When the type of action and its target are analysed, the 209 final nursing interventions encompass the essence of nursing actions as outlined by Orem's nursing self-care theory (1995). When nurses face a patient with a deficit in self-care, they will guide them, provide physical support, maintain an environment suitable to personal development, and teach them. Some nursing interventions such as 'Positioning the patient', 'Assisting on standing', 'Transferring the patient' and 'Assisting on walking' are examples where nurses must work alongside the patient or provide physical assistance. Doherty-King et al. (2014) measured the frequency and duration of nursing care interventions directed at older patients' mobilisation, with standing and transferring being the most frequent mobility tasks. However, the average ambulation time was less than 2 minutes. The same study found that dependent patients experienced fewer mobility events, with none associated with ambulation initiated by nurses. Our findings diverged from that study's results, since mobility actions in our study are considered in the EHR.

Our findings also demonstrate that nurses empower patients to overcome their impairment in self-care. Several interventions illustrate this idea, including 'Instructing patient to self-turning', 'Training patient to self-transferring using device' or 'Teaching patient about walking device'. Better health outcomes can be achieved through patient education, a process in which nurses play a vital role (Kennedy & Parish, 2021). When self-care is depleted, whether as a result of an unexpected event or normal ageing, a transition process is initiated. While preparation and knowledge facilitate the transition, any lack of preparation makes it a challenge (Meleis, 2012). Our research emphasises the value of patient education and instruction in self-care, including the use of appropriate assistive technologies.

We do not intend to provide a catalogue of nursing interventions or instructions for nurses to implement with individuals with a self-care deficit. Nurses must prescribe interventions based on their assessment of the patient and a clear understanding of the patient's needs.

Limitations

We focused on the documents provided by the Ministry of Health, which comprised solely SAPE® customisations from public health facilities in 2013. Records after that date were not available therefore the relevance to nursing roles and interventions during the COVID-19 pandemic 2019 to

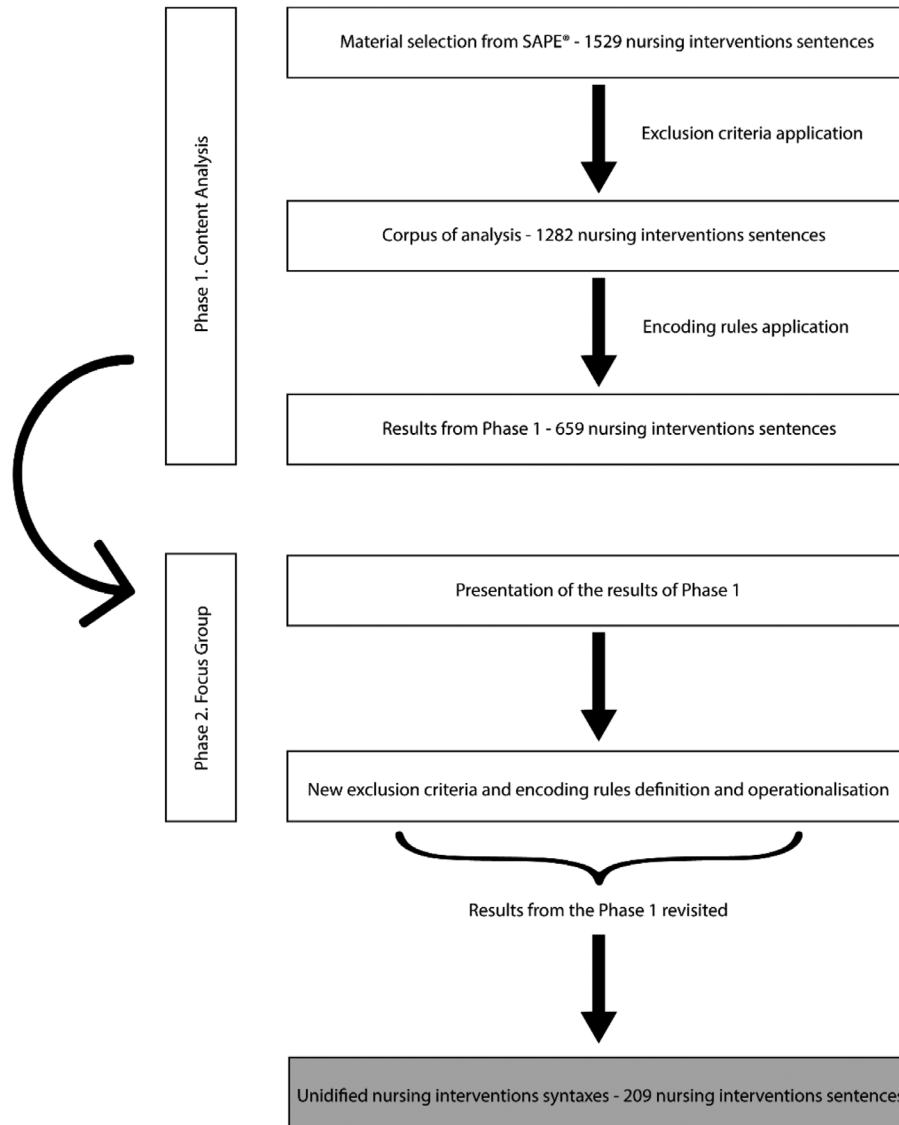


FIGURE 1 Summary of the results following several phases of the research

2023, might not be as significant as for the pre 2019 period. Furthermore, the information that comprises the corpus of analysis was chosen based on study team-developed criteria. This is a point of view on grasping the study object that we acknowledge may differ among nations. We had a single focus group meeting in 2018, which allowed for data saturation but did not detect any changes in participant opinion over time. A strength of the study is the testing of nurses' views about nursing interventions and priorities over time. We did not share our findings with the participants; thus, additional clarifications may be limited.

CONCLUSIONS AND RECOMMENDATIONS

We confirmed that nurses cooperate with clients, offering physical aid and encouraging them to overcome their handicap regardless of the circumstances in which self-care is

hampered. There is no consensus on the nomenclature of nursing interventions in the context of self-care, resulting in several interventions sentences on the EHR expressing the same nursing behaviour. We found issues with the design of nursing interventions sentences locally, which makes semantic interoperability problematic despite EHR usage of a reference terminology model and terminology such as ICNP®.

Disagreements might occur over how decisions/care should be made at the point of care for the patient across units or even institutions if nursing data are not regarded as effective and accurate. Patient safety may be jeopardised when nursing care is called into question. Identification of the problems nurses have in meeting the nursing diagnosis of self-care deficit is beyond the scope of the current study however, we suggest that further research be done on that topic.

We recommend studies be undertaken to link nursing diagnoses to nursing interventions and establish evidence for such



links. This would be a significant step forward in developing EHRs that support evidence-based practice and accurately represent nursing care in the scope of self-care.

Global efforts are needed to formalise and integrate nursing knowledge into EHRs, allowing nursing care to be visible in patient outcomes and nurses' critical role in patient care emphasised, regardless of location.

IMPLICATIONS FOR NURSING PRACTICE

The description and representation of essential nursing interventions are provided under the umbrella of self-care. Analysis of what is done on this subject becomes possible as well as the possibility of reflecting and comparing international to nursing clinical practice and policy making related to accurate and timely visibility of nursing interventions and patient outcomes.

IMPLICATIONS FOR NURSING POLICY AND HEALTH POLICY

This study contributes to the standardisation of the terminology used by nurses when defining interventions focusing on patient self-care. Problems identified with the construction of nursing interventions on EHR, reveal the challenges of semantic interoperability despite the use of an EHR with a reference terminology model (ISO 180104) and terminology such as ICNP*. Although ICNP* has been extensively adopted, terminology alone is insufficient to ensure that content and meaning are exchanged accurately and reliably between different computer systems. If EHR incorporates a nursing ontology to accomplish semantic interoperability, such a policy will promote semantic interoperability, patient quality and continuity of nursing care.

This study's findings may help other nurses worldwide avoid the same pitfalls associated with using locally customised EHR and shed light on the significance of adopting a nursing ontology for EHR.

AUTHOR CONTRIBUTIONS

Study design: CQ, MATCPS, IC, AB, AC, FP; data collection: CQ; data analysis: CQ, MATCPS; study supervision: MATCPS; manuscript writing: CQ, JG, HN, IC; critical revisions for important intellectual content: CQ, MATCPS, JG, HN, IC, AB, AC, FP.

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CONFLICT OF INTEREST

The authors declare that they have no competing financial interests or personal relationships that could have influenced the work reported in this paper.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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