

Cross-cutting model for R&D and innovation activities management: On the path of modern nursing research

Modelo *Cross-cutting* para gestão de atividades I&D e inovação: no caminho da moderna investigação em enfermagem

Modelo *Cross-Cutting* para la gestión de actividades I&D y la innovación: en el camino de la investigación moderna en enfermería

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Abstract

The excellence of a research unit relies on the merits of its team and the effectiveness and efficiency of its organizational and management model. The purpose of this article is to offer a simple presentation of the integrated management Cross-Cutting Model (CCM) which was created, since 2002, as a result of the several evaluation processes conducted by the Foundation for Science and Technology (FCT) to the Health Sciences Research Unit: Nursing (UICISA: E). This original model was designed based on bottom-up contributions and top-down guidelines, and it is today the trademark of the UICISA: E and the driving force of the team's merit and the quality of the scientific evidence production, synthesis, dissemination, implementation, and evaluation activities.

Keywords: research; nursing; integrated management; science; evidence; knowledge

Resumo


A Excelência de uma unidade de investigação depende do mérito da sua equipa e da eficácia e eficiência do seu modelo de organização e gestão. É objetivo deste artigo apresentar de forma simples e prática o *Cross-Cutting Model* (CCM) de gestão integrada que foi tecido, desde 2002, ao longo da história de sucessivas avaliações da Unidade de Investigação em Ciências da Saúde: Enfermagem (UICISA: E) promovidas pela Fundação para a Ciência e a Tecnologia (FCT). Este modelo original, construído através de contribuições *bottom-up* e orientações *top-down*, é hoje a imagem de marca da Unidade e fator impulsionador do mérito da equipa e da qualidade das atividades de produção, síntese, disseminação, implementação e avaliação de evidência científica.

Palavras-chave: investigação; enfermagem; gestão integrada; ciência; evidência; conhecimento

Resumen

La excelencia de una unidad de investigación depende del mérito de su equipo y de la eficacia y eficiencia de su modelo de organización y gestión. El objetivo de este artículo es presentar de forma simple y práctica el *Cross-Cutting Model* (CCM) de gestión integrada que se ha construído desde 2002 a lo largo de la historia de sucesivas evaluaciones de la Unidad de Investigación en Ciencias de la Salud: Enfermería (UICISA: E), promovidas por la Fundación para la Ciencia y la Tecnología (FCT). Este modelo original, construído a través de contribuciones de arriba abajo y orientaciones de abajo arriba, es hoy la imagen de marca de la unidad y el factor que impulsa el mérito del equipo y la calidad de las actividades de producción, síntesis, difusión, implementación y evaluación de la evidencia científica.

Palabras clave: investigación; enfermería; gestión integrada; ciencia; evidencia; conocimiento

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Introduction

In a simple and practical way, this paper describes relevant aspects of the course of the Health Sciences Research Unit: Nursing (UICISA: E) and its history of success in overcoming several demanding moments of external evaluation by the FCT since 2002 up to the present moment. Through this paper, the readers are expected to understand the process of creation and development of an original Cross-Cutting Model (CCM), which ensures the integrated management of a qualified research team from several academic and clinical institutions. This model allows the team to develop research activities of excellence, which are driven by the intersection of the so-called Development Strategic Axes (*eixos estratégicos de desenvolvimento*, EED), combining specific measures, techniques, and specialized resources. The UICISA: E has created a trademark which has provided the impetus for the Unit to go further in exploring the path of modern nursing research.

Our perspective on the path of modern nursing research: Teams of nursing researchers with extensive experience in interdisciplinary and collaborative R&D and innovation activities and in leading competitive funded projects; Research developed in accredited Research Units in Nursing; Research oriented towards the resolution of complex and priority health conditions; Innovative research of healthcare tools and link to the industry; Promotion of evidence-informed practice; Strong national and international impact of the knowledge disseminated by the Unit; and Promotion of scientific culture, social engagement, and literacy.

FCT and Science In Portugal

On the National Scientists Day, Heitor (2017), recalling Mariano Gago, an important name in Portuguese science, emphasized the need for co-accountability, cooperation, tolerance, service, and truth in science. Continuing the legacy of Mariano Gago, Portugal has evolved as a good example of the promotion of scientific culture, the researchers' training process, and the valorization of science in Europe.

With the purpose of strengthening the link between scientific culture and scientific poli-

cy, the Foundation for Science and Technology (FCT) has invested on a regular and systematic process of evaluation, accreditation, and funding of R&D units. The FCT has been regularly assessing R&D units in accordance with Decreto-lei n.º 125/99 de 20 de abril, rectified by Statement of Rectification no. 10-AI/99, of 31 May (Declaração de Retificação n.º10-AI/99 de 31 de maio), and amended by Decree-Law no. 91/2005, of 3 June (Decreto de lei n.º91/2005 de 3 de junho), which establishes the legal framework for scientific research and technological development institutions (a new draft law has been submitted to the Assembly of the Republic in 2018 - Draft Law no. 51/2018, of 14 February (Proposta de lei n.º51/2018 de 14 de fevereiro), approved by the Council of Ministers). There have been several evaluation moments with international panels since 1996 (in 1996, 1999, 2003, 2007, and 2013).

R&D units are at the basis of the organizational structure of the scientific and technological system in Portugal and should provide the necessary human and technical resources for the development of relevant R&D activities (Regulamento n.º 503/2017 de 26 de setembro). To achieve its mission and vision, they need a motivated, resilient, and scientifically talented team to develop research projects that respond to complex societal challenges. To this end, each Unit is responsible for creating innovative and creating environments in the workplace and each researcher is responsible for achieving a high level of reliability, scientific dignity, and capacity to develop interdisciplinary and multidisciplinary R&D activities based on resilience, collaboration, and solidarity.

The Health Sciences Research Unit: Nursing (UICISA: E) is imbued with this spirit and orientation. Over the past 17 years, and taking the different panels' criticisms and recommendations as opportunities for growth, its management has been designing an original organizational model as a result of the merger between bottom-up and top-down processes. Today, this model allows for the development of R&D and R&I activities of excellence in a stimulating and creative environment. The UICISA: E has acquired a relevant position among FCT-accredited units and captured the attention of the national and interna-

tional scientific community. Moreover, it has expanded its network of partner institutions and brought together a qualified team, which allow it to meet the three FCT evaluation criteria for 2017-2018:

(A) Quality, merit, relevance and internationalization of the R&D activities of the Integrated Researchers in the R&D Unit Application in the immediately preceding five year period (2013-17); (B) Merit of the team of Integrated Researchers; and (C) Appropriateness of objectives, strategy, plan of activities and organization for the following five year period (2018-2022)". (FCT, 2018, pp. 5-6)

UICISA: E a path

The UICISA: E (UID/649/2002), which is hosted in co-responsibility by the two nursing schools in Coimbra (Nursing School Dr. Ângelo da Fonseca - ESEAF and Nursing School Bissaya Barreto - ESEBB), started operating on 22 April 2002, as can be seen in the formal declaration concerning the R&D Units Multiannual Funding Program signed by the representatives of ESEAF and ESEBB and the Principal Investigator of the project (Pereira, Cardoso, & Rodrigues, 2013). The FCT external evaluation took place in 2003 and ended with an in-person site visit in the city of Porto, Portugal, in January 2004. In March 2004, the external evaluation panel, which was coordinated by Professor Ruy Lourenço of the New Jersey Medical School, recognized the project's potential and classified it as sufficient: "*This is an ambitious and exciting undertaking from a group that is proceeding impressively to develop the potential for being an important research centre*" (Evaluation Panel, 2004).

In February 2007, the Units were again evaluated and those classified as sufficient received no funding. The unit's team was very pleased to welcome the members of the panel coordinated by Professor Fernando da Silva, from the University of Amsterdam, who acknowledged the merit of the Project [HESC-Centro-Coimbra-742] and classified it as good: ". . . This Unit is young and active, and continues its dynamic development with many notable achievements." (Evaluation Panel,

2008).

In 2013, the units were again evaluated and the Coordinator of the Life and Health Sciences panel was Professor William Cushley. The process did not include site visits and foresaw funding for units classified as good. The UICISA: E team strived to demonstrate the results of its effective and sustained work with patience and resilience. After the different phases of the evaluation process (application; reception of the reports of external experts; rebuttal; reception of the decision of the review panels; appeal; notification of the final decision of the review panels; restructuring plan), the panel accepted the arguments on the team's merit in the final report, particularly regarding its internationalization: "...The appeal to re-consider criticism on the internationalization of the Unit was well-taken and based upon re-evaluation of all factors detailed in the appeal we suggest to increase the score of criterion B from 3 to 4" (Painel de Avaliação, 2013). Thus, the UICISA: E (Ref. UID/DTP/00742/2013) obtained additional funding allocated via the Restructuring Fund and was recognized as an accredited unit, with the classification of very good, as can be seen in the report of the Ministry of Education and Science (2015).

UICISA: E a brand

Organization and management

The Nursing School of Coimbra (ESENfC; host institution) has provided the UICISA: E with the necessary facilities, human resources, infrastructures, and technical resources for the establishment of creative, dynamic, and collaborative work environments. In this way, the Unit has shown its capacity to stimulate employment in science, with the associated institutional co-responsibility, through the Scientific Employment Stimulus Program. According to its bylaws, the Unit has different management bodies: the Scientific Coordinator (who is responsible for ensuring compliance with the criteria of an FCT-evaluated unit); the Scientific Committee (a body with its own powers and delegated powers, composed of the Scientific Coordinator, the Cluster Coordinators, the Group Coordinators, and two researchers appointed by the Unit's Scientific Board); the Scientific Board (which

monitors the unit's progress and decides on its vision and strategic guidance); the Administrative Committee (which is responsible for the financial management); and the External Advisory Board (which is composed of five Ph.Ds., of whom two are foreigners). The External Advisory Board interacts with the Unit at a distance and in person and formulates annual opinions.

The main objectives of UICISA: E are to develop research in priority health areas with the purpose of providing relevant scientific contributions to knowledge advancement and achieving high-value health care; to develop experimental and applied research in health care technologies for the creation of medical devices/technical procedures; to conduct R&D activities for the synthesis and implementation of the best available evidence to promote evidence-informed nursing care; to train researchers, from initiation to advanced research, through the development of scientific research activities, the leadership of interdisciplinary research programs, and the production, dissemination, synthesis, and application of scientific knowledge.

In its mission as an accredited institution, the Unit aims to develop R&D activities at an international and interdisciplinary level with a view to providing a sustainable and socially responsible response to complex problems related to health promotion, disease prevention, and care delivery to ill, disabled, and end-of-life patients. This has been further reinforced by the environment of interdisciplinary and collaborative research, the excellence in the synthesis and implementation of science for the promotion of evidence-informed health care, and the merit in the creation of health care technologies aligned with the needs of both patients and health professionals.

We envision a fully recognized brand where we play the role of leading center of excellence, a pioneer in paving the way towards modern nursing research at a national and international level.

In the path of a modern nursing research, science of care

The UICISA: E Coordination has been always strongly committed to the national strategy for research and development, based on the spirit of scientific culture, tolerance, service, and truth. At the same time, to fulfill this

purpose, it has always argued that nursing, Science of Care, should have its own place in the classification of sciences. Although the research activities require interdisciplinary and transdisciplinary collaboration, for the differentiated contributions to be relevant, each scientific field must enhance its own knowledge value and provide differentiating interventions. As in a football team, teamwork leads to the best results; however, that is only possible if each athlete know their place in the field and demonstrate their differentiating skills. The interdisciplinary and interprofessional contribution of nursing and nursing researchers will be more useful if nursing is recognized as an individual scientific field, at the same level as the other health sciences. Universal health coverage, which is designed to ensure that nobody is left behind, is not possible without the nursing care and science (United Nations, 2015). The *triple impact* of nursing of improving health, promoting gender equality, and supporting economic growth (Crisp & Tavistock, 2018) is only possible with an investment in accredited and funded nursing research.

The relevant course of UICISA: E as an FCT-accredited institution is an example of the resilience, reliability, and validity of the research activities which translate into evidence-informed health care and lead to effective gains such as improved clinical decision-making, patient satisfaction, and cost-effectiveness. The UICISA: E research activities converge into the science of care and generate useful knowledge for understanding complex person-centered health care, from a systemic and ecological dimension, in its cycle of production of evidence, synthesis of evidence, dissemination of evidence by practitioners, dissemination of evidence by the users, implementation of evidence, and promotion and evaluation of evidence.

The research activities developed in a team environment produce a symbiosis between education, management, and care, and create training opportunities for the new generation of nursing researchers (skill mix) to be able to develop research and influence the health policies, namely those related to the provision of services at a local, intersectoral, governmental, and international level.

Through the diversified and continuous

collaborative participation in international networks, the team demonstrates significant merit, contributing to the science of care worldwide and expanding a brand which has been widely recognized and sought after: the UICISA: E brand.

UICISA: E original cross-cutting model for R&D activities management: On the path of modern nursing research

A good idea may be created by insight, but a work is built through progressive upgrades and intersection of multiple bottom-up solutions and top-down guidelines.

The first rule for ensuring high-quality standards is to continuously update the top-down guidelines, always giving priority to aspects of universal value. It is necessary to continually pay attention to the research agendas on universal health coverage, the legislation and policies about urgent health needs, as well as on supportive and collaborative organizational strategies, which are usually submitted for public discussion first. Nowadays, the role of education and research are intercurrent so the teacher researcher or the nurse researcher must breathe scientific culture, being part of the discussion and the decision-making process on the major issues of which all of us are co-responsible. The second rule is that criticism always brings something positive to the experience, even if it hurts. This pain can lead to a proactive reaction and, consequently,

to a more advanced solution. Over the past 17 years, it was possible to find arguments to tackle barriers and threats and transform them into opportunities, combining information, knowledge, and action in the search for wisdom.

A work is built by combining ambitious and realistic activities, always looking for new solutions and, above all, giving consistency to the desired results over time. Today, the UICISA: E is case study within the scope of the affirmation of the science of care and the nurse researcher, as well as of its performance in collaborative interventions aimed to address the complex problems which affect the community and determine the perfectibility of our societies.

Many research activities conducted in a fragmented manner do not contribute to the sense of unity. However, when we have the inspiration and the rationale for designing an integrated model, the results slowly create different option chains and, finally, become solid achievements.

The UICISA: E CCM, which always impresses the foreign researchers who visit the Unit, is embodied with this spirit, dedication, creativity, and hard work.

The CCM is based on three pillars (Figure 1): the team's strength and merit; the focus of the research projects on priority topics; and the intensification of R&D activities through the intersection of the eight EED.

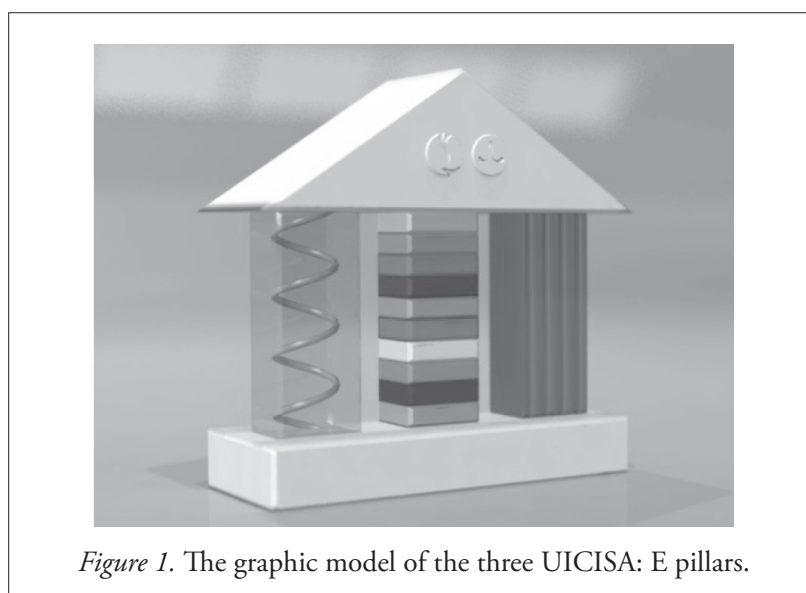


Figure 1. The graphic model of the three UICISA: E pillars.

Pillar 1: The strength of an experienced and organized team, capable of breaking new ground in R&D for building the modern nursing science.

Six factors contribute to the team's strength and merit:

- a) The researchers have a positive and inspiring work environment;
- b) As a result of its visibility and trademark, the UICISA: E has attracted and retained a relevant critical mass consisting of 131 integrated Ph.D. researchers, 38 integrated non-Ph.D. researchers, and 34 collaborators.
- c) The added value of this critical mass translates into the scientific, technical, cultural, and artistic value available within the team: experienced researchers involved in national and international networks; researchers undergoing mobility in national and international top research centers to conduct R&D activities and advanced training, as well as use relevant resources and infrastructures; integrated researchers leading networks, influencing health policies, and seeking funding for research; researchers in integrated researchers' training programs from initiation to advanced research; and the increase in the number of publications with international collaboration in indexed journals and other sources;
- d) The team's merit is strengthened by the fact that researchers have the possibility to develop R&D activities in a large network of 24 academic and clinical institutions, increasing their influence in the communities of various regions, contributing to the resolution of specific health and literacy needs, and sharing more resources and infrastructures.
- e) The team's strength also benefited from the correction of the asymmetry in the intervention of the three research groups described in prior applications. Since 2014, at the recommendation of the evaluation panel, these groups began to work together as a consistent whole which converged into a shared, focused, and skill-mix-aggregating strategy.
- f) An important factor contributing to the team's consistency was the creation of clusters, which aimed to ensure the effectiveness of the research activities and the team's cohesion. In 2014, the UICISA: E /ESEnFC cluster was created in the Health School/University of Minho as part of the Clinical Academic

Center of Braga. In 2018-2019, in addition to the increase in the number of UICISA: E partner institutions from different regions of Portugal, the total number of clusters increased to five (UICISA: E/ESEnFC at the Health School of the University of Minho; UICISA: E/ ESEnFC at the Health School/ Polytechnic Institute of Viseu; UICISA: E/ ESEnFC at the Health School /Polytechnic Institute of Viana do Castelo; UICISA: E/ ESEnFC at the Health School/Polytechnic Institute of Bragança; UICISA: E/ ESEnFC at the Coimbra Hospital and University Center) and the link to Clinical Academic Centers expanded (Braga and Coimbra). It is important to understand that the clusters are not sub-units or autonomous entities but rather ways of organizing the Research Unit, facilitating the integrated development of activities, and creating synergies between the different researchers scattered among the various institutions. The creation of clusters in the partner institutions should meet the following criteria: the institution must have at least five Ph.D. researchers integrated in the UICISA: E; it must have the resources required to develop and promote research according to the Unit's objectives; and the researchers must accept the established rights and duties and commit to the Unit's development strategy. This ecosystem facilitates the team's sustained increase, with multiple opportunities for the development of relevant R&D activities, particularly those related to experimental research and implementation of evidence. Each cluster has a representative in the Unit's Scientific Committee.

Pillar 2: The focus of the Structuring Projects (SPs) integrated in the UICISA: E in priority health areas: Violence in Society and Institutions; Health Education and Literacy; Pain Management; Innovation in Nursing Care Technologies; Active Aging; Health Professionals' Development and Training; Wound Treatment; Methodologies of Differentiated (Complex) Nursing Care; Patient Safety and Care Effectiveness; and Health Transitions and Self-Care. The definition of these 10 priority topics resulted from the topic indexation of the competitive and funded projects of UICISA: E, the analysis of the research priorities of the European agenda, and the

evidence of health gains resulting from nursing care research in these specific areas (World Health Organization, 2015).

Pillar 3: Cross-sectional combination of specific measures, techniques, and specialized resources which support the team during the implementation of its projects and R&D activities, that is, the EED: Researchers' Training; Synthesis and Implementation of Science; Experimental and Applied Research in Health Care Technologies; Edition and Dissemination of Scientific Knowledge; Ethics; Extension and Society Engagement; International Collaboration; and Optimization of the UICISA: E Cross-Cutting Model. In their course of development, the teams and their projects enhance the quality of their activities and ensure the reliable achievement of their goals by intersecting and incorporating the opportunities resulting from the synergies between the EED. The 8 EED were not designed and implemented on single moment but rather at different times, depending on the vision and the opportunities. They start from a small seed which is watered until it becomes a recognized and solid strategy. In some cases, it was necessary to mobilize resources, accommodate mechanisms, and allocate human and material resources, which was only made possible due to the constant investment of the unit's host institution. The EED have been progressively evolving to accredited entities, with their own regulations, executive coordination, and human resources.

1. Development Strategic Axis for Researchers' Training

Objective: One of the UICISA: E priorities is the continuous training of its team within an integrated chain system of researchers' training from research initiation to advanced research.

Resources: Planning, development, monitoring, and evaluation of training activities for national and international researchers.

Process of development and outcomes: With a strong sense of commitment to training young researchers and linking research to education, in 2013, the Unit created the *Young Investigator Window* (YIW) initiative, which aimed to increase the dialog between UICISA: E and undergraduate students. In 2013, the unit also started to implement the Research Initiation Rotations (RIR), in col-

laboration with the ESEnFC Technical-Scientific Board) (TCB; <https://www.esenfc.pt/pt/page/100004070/56>). Through the YIW/RIR initiatives, the Structuring Projects (SP) can welcome students in RIR. In RIR, students participate in research initiation activities as part of SP and under the supervision of a researcher. At the end of these activities, they have to elaborate a structured and validated report. Then, the TCB registers the RIR by academic services and sends this information to be included in the diploma supplement. Since 2013, 31 SP have welcomed RIR students and 71 of them have successfully completed the RIR. These activities are an important challenge to generate impact of the research on the curriculum; to stimulate the students' scientific culture by helping them to learn through research and to remain in contact with research teams in the future; and to motivate teachers to include research activities and findings in the curriculum. Our ambition is to expand this RIR program to the institutions involved in UICISA: E Clusters, following the same rules and mobilizing their regional specificities.

Through the increase in the number of international collaboration agreements mediated by ESEnFC, UICISA: E and the National and International Relations Office (GRNI), it is possible to maintain a continuous flow of foreign researchers developing advanced research at the UICISA: E, particularly sandwich Ph.D. and postdoctoral programs. These programs intensify the teams' interventions and promote scientific culture, the spirit of tolerance among people from different countries, and the willingness to share ideas and experiences. The maintenance of an advanced researchers' training plan requires a set of active and competitive projects capable of offering research opportunities, as well as researchers available to provide mentoring and supervision. Our purpose is to contribute to the development of the international scientific and academic community, with a special emphasis on Spain, Brazil, and other Latin-American countries.

With regard to researchers' training, the UICISA: E also offers a training program which includes international seminars for project discussion, as well as courses and workshops

for invited foreign researchers; Ph.D. thesis supervision activities within the scope of the Ph.D. in Health Sciences - Nursing Domain (in collaboration with the Faculty of Medicine, University of Coimbra) and the Ph.Ds. in Nursing of the University of Porto, the Portuguese Catholic University, and the University of Lisbon; training activities for clinical nurses, through the Clinical Cluster, with integration into projects, namely for practical guidance.

2. Development Strategic Axis for Science Synthesis and Implementation

Objective: To maintain the status of center of excellence for the synthesis and implementation of evidence, within the scope of an international network of around 70 centers in different continents, which aims to meet the specific health needs, facilitate evidence-based action, and contribute to increasing decision-making skills, patient satisfaction, and health care effectiveness.

Resources: Resources and techniques of accredited training (Comprehensive Systematic Review Training Program - CS RTP and Evidence-based Clinical Fellowship Program - EBCFP), mentoring, publication of systematic reviews and implementation of evidence in clinical practice, using the model and the tools of the Joanna Briggs Institute (JBI).

Process of development and outcomes: In 2010, after a first contact with Professor Alan Pearson, the JBI CEO at the time, there was an opportunity to create a Portuguese JBI Center. The first group of UICISA: E researchers attended the CS RTP course at the Thames Valley University, London, on 2-5 February 2010.

After overcoming the initial uncertainties and using a trial-and-error approach, we submitted an application and the Portugal Center for Evidence-Based Practice: a JBI affiliated center (PCEBP) finally became a reality on 17 March 2011.

The creation of the PCEBP laid the first stone for the Strategic Development Axis for Science Synthesis and Implementation with the integration into a community of 70 centers worldwide, which communicate mainly in English. It was an opportunity seized at the right moment. The secret to success is often

courage and impetus, exactly like the sprinter who knows the exact moment to start pulling away from other runners towards the finishing line.

For having achieved the indicators established by the JBI, such as the publication of systematic reviews and the regular participation in directors' meetings and in methodological groups, the center became a Center of Excellence in 2016 (Portugal Center for Evidence based Practice: a Centre of Excellence).

As a strategic axis of the Unit's development, and imbued with an aggregating and empowering spirit, its core staff, through the CS RTP and regular mentoring activities, is strongly focused on building a community of collaborating researchers from several academic and clinical institutions to develop science synthesis skills, achieve consensus and standardize communication, and keep up with the advancements in synthesis studies, as can be seen in Apóstolo (2017).

With the desire to advance in the cycle of science translation, the first EBCFP course (http://joannabriggs.org/assets/docs/JBI_Clinical_Fellowship_Program_2018.pdf) will start in 2018 with the participation of academics and nurses from the CHUC cluster. After the synthesis interventions' maturity period, our goal right now is to better understand the implementation processes, thereby bringing the best available evidence closer to the professionals and patients in clinical settings.

3. Development Strategic Axis for Experimental and Applied Research in Health Care Technologies

Objective: To increase the laboratory intensity and the experimental and applied research in health care technology.

Resources: Facilities, equipment, and specialized supervision of TecCare for the intensification of laboratory activities, creation of devices, and clinical innovation.

Process of development and outcomes: Based on the acquisitions of its Strategic Development Axis for Science Synthesis and Implementation, the UICISA: E management reflected on the panel's comments on the "limited experimental intensity of the studies and the need to focus on the nurses' care

activities” and acknowledged the effective limitation of clinical research, as well as the limited experience of patent registration and technological innovation. Therefore, an urgent need emerged to investigate nurses’ care tools in order to improve the effectiveness and efficiency of care delivery and the relief of patient suffering. As a result of this awareness of the need to create and improve tools and contexts, the concept and logo *TecCare* was created, which was properly regulated is expected to play a highly differentiating role in the UICISA: E brand in the present and in the future. However, in the same direction and from an interdisciplinary perspective, the political guidelines showed effective signs of interest in applied research, increasing the funding opportunities. Investing in knowledge means encouraging the institutions to effectively open the access to education, training, culture and knowledge, making high-quality scientific research activities available to everyone, regardless of age, origins, physical, social and economic status (Sistema de Apoio à Investigação Científica e Tecnológica, 2016). The mission of the Agency for Clinical Research and Biomedical Innovation, which is funded by the government (FCT and Infarmed) and the private sector (Health Cluster and Apifarma), is to strengthen the funding conditions for clinical and translational research (Comunicado do Conselho de Ministros, 2018). The R&I Thematic Agenda - Health, Clinical and Translational Research (Extrato do Plano Nacional de Ciência e Tecnologia, 2017) is an ambitious initiative aimed to identify priorities in the areas of health research and innovation in Portugal until 2030. Clinical research covers patient-oriented research; epidemiological and behavioral studies; research on outcomes and in health services; and evaluation of health technologies (National Institutes of Health as cited in the Extrato do Plano Nacional de Ciência e Tecnologia, 2017). On the other hand, the concept of translational research relates to the practical application of scientific knowledge. It includes not only clinical trials, but also the application of the results of clinical studies in the health policies and practices of the community and health innovation. It is also an opportunity to strengthen the support to clinical academic

centers, gathering health care units, biomedical R&D centers, and medicine and health schools, with their own legal framework and specific funding and evaluation procedures and promoting clinical research in a close interaction with the health care units (Decreto-Lei n.º 61/2018 de 3 Agosto).

The controversy around the greater importance of fundamental research or oriented, applied and clinical research must be clearly understood and balanced. Funding decisions require the involvement of multiple agents and the promotion of interdisciplinary and inter-industrial research, partnerships between the public sector, the private sector, and civil society, and the use of the entire value chain of research and innovation (from fundamental research to applied research and cutting-edge innovation).

The UICISA: E plan of activities and scientific and technological development strategy for the next 5 years (2018-2022), through the Strategic Development Axis for Experimental and Applied Research in Health Care Technologies, seeks to implement an ambitious program of technological innovation oriented towards the enhancement of the socio-economic environment surrounding the R&D unit, and the development of more creative solutions for improving people’s transition processes.

We envision *TecCare* as an accredited structure in the technological innovation of health care, in line with the PCEBP on evidence synthesis and implementation.

There is no conscious creative effort at all comparable to what scientific research is doing to better the products we use. Osborn

4. Development Strategic Axis for Edition and Dissemination of Scientific Knowledge

Objective: The edition and dissemination of scientific knowledge to increase the visibility and impact of scientific productivity.

Resources: Structure to support the process of review and dissemination of an indexed journal, monographs, proceedings supplements and other open-access scientific dissemination material.

Process of development and outcomes: The most important resource of this strategic axis is the scientific edition process, through web-

page management, in compliance with the recommendations of Open Science.

The quarterly publication of the Journal of Nursing Referência (indexed and bilingual) is the hallmark of UICISA: E/ESEnfC. This year, the Journal of Nursing Referência celebrates its 20th anniversary. With approximately 671 published articles, it is indexed in 10 relevant databases and serves a community of national and international readers (<https://rr.esenfc.pt/rr/>). The Journal also publishes proceedings supplements.

Thanks to the contribution of the team's members in the review and quality control process, the UICISA: E maintains the publication of books, with a special emphasis on the Monographic Series Health Education and Research, with a total of 17 published works.

Through this UICISA: E/ESEnfC axis, international scientific events are organized on a regular basis with the purpose of bringing together researchers from different countries to share research and innovation results.

The next challenge of this EED is to transform the published materials into subproducts (abstracts, diagrams, flyers, guidelines) aimed to disseminate the results of UICISA: E research projects using by adapting the language and format to promote the literacy of citizens, clinicians, and nursing students.

5. Development Strategic Axis for Ethics

Objective: To ensure scientific dignity and the highest ethical standards.

Resources: Resources to support all ethical procedures in research activities.

Process of development and outcomes: According to the FCT, ethics is a key issue for scientific dignity, honesty, and truth and an essential aspect in funded research activities (Fundação para a Ciência e a Tecnologia, 2015).

The creation of the UICISA: E Ethics Committee in 2010 was a very important step for the internal and external scientific community. Up to this moment, the Committee has issued its opinion on approximately 472 requests. Based on the political guidelines, we have been following the discussion about the decree-law which aims to further explore the legislative aspects concerning ethics in health

care delivery and in clinical research, providing the Ethics Committees for Health (CES) with an aggregating organizational structure to influence primary and hospital care, public health, but also health care delivery involving advanced medical technologies (Conselho Nacional de Ética para as Ciências da Vida, 2017). We will update the unit's regulation as soon as the law enters into force.

The UICISA: E strategic guidelines for this axis are as follows: to participate in discussion forums, namely those of redÉTICA; to adapt research procedures to codes of conduct; to implement a training program for researchers, students, teachers, and practitioners on the methodological issues which must be considered to ensure the scientific dignity, rigor, and usefulness of research, namely bias in the research proposal, implementation, and reporting; citation and paraphrasing errors that lead to high rates of similarity; a careless attitude in the protection of human participants and animal subjects in research; lack of clarity around sharing of responsibility among team members; omission of previous results; omission of data unfavorable to one's theories or disregard of possibly contradictory theories; use of opinion statements as facts; an excessive or biased interpretation of results that does not contribute to scientific advancement and misleads the readers; not declaring funding and potential conflicts of interest; publishing works that are restricted by deposit policies; not taking into account the type of open-access policy established by the editors; lack of originality; inaccuracy in peer-review activities; low transparency in the conflicts of interest; lack of supervision of methodological procedures by the ethics committee or data protection committee; lack of a clear, informed written consent.

UICISA: E activities involve human participants, thus we require the approval of the ethics committee; informed consent forms; the guarantee of legally imposed rights for the protection of vulnerable individuals and groups; the legal framework of data protection; the statement of preservation and protection in all research activities involving the collection, processing, and storage of sensitive data on health, sexuality, life experiences, lifestyles, attitudes, and opinions; the compli-

ance with international guidelines, such as the *Principles of Transparency and Best Practice in Scholarly Publishing* of the *Committee on Publication Ethics* (COPE), the *Directory of Open Access Journals* (DOAJ), the *Open Access Scholarly Publishers Association* (OASPA), and the *World Association of Medical Editors* (WAME).

In collaboration with the Strategic Development Axis for Edition and Dissemination of Scientific Knowledge, we have created the conditions to ensure ethics in scientific writing and dissemination processes, namely electronic similarity checking (*Crossref Similarity Check powered by iThenticate*), rigor in the creation and availability of metadata (PDF, XML, HTML), and institutional and extra-institutional data archive and preservation resource (Portico, Romeo).

6. Development Strategic Axis for Extension and Society Engagement

Objectives: Promotion of relevant scientific, cultural, artistic, social, economic, and health literacy projects and initiatives for society.

Resources: Networks of partner institutions working together in projects oriented towards and focused on the needs of the communities and citizens and synergies between research and society.

Process of development and outcomes: This axis results from a vision of solidarity research where researchers focus on people, supported by experience and strongly committed to social service and engagement. With the strong impetus of open science and *Ciência Viva* (Rollo, Azevedo, & Salgueiro, 2017), an interesting route was developed in the name of science. Based on the Triple Helix (Sousa, Mónico, Castilho, & Parreira, 2018) and Quintuple Helix models (Carayannis & Campbell, 2010), and given the time of unprecedented change and increasing global interdependence, it will be increasingly possible to build reflective, innovative, and inclusive societies through research. The goal is to improve cooperation between science and society in order to allow for a broader social and political support to science and technology in all member states, while respecting the cultural heritage, memory, and identity.

Through this Strategic Axis, we envision strong synergies with the UICISA: E clusters

in different regions of Portugal. We aim to develop funded projects, supported by local institutions, with the purpose of better understanding very specific realities which require social-oriented approaches.

7. Development Strategic Axis for International Collaboration

Objective: To promote nursing research worldwide, with interdisciplinary and collaborative work.

Features: Structure to support the creation of networks and initiatives for researchers' collaboration and mobility.

Process of development and outcomes: The UICISA: E team has early realized that its merit and excellence depend on its international visibility and recognition.

To this end, the following activities will be reinforced in collaboration with the ESEnFC National and International Relations Office: To support the participation in international networks as leaders, influence health policies, seek funding for research, and exchange expertise; To support publications in international collaboration in high-quality scientific journals (JCR/SJR/SciELO Citation Index), namely the network of scientific journals relevant to the development of nursing and allied sciences; To manage a program of mobility to national and international research centers of excellence with the purpose of developing R&D and advanced training activities, as well as using relevant resources and infrastructures; To maintain the annual plan of researchers' mobility missions to international scientific meetings with the purpose of disseminating research results; To intensify activities in international scientific institutions and networks relevant to nursing.

8. Development Strategic Axis for Optimization of UICISA: E Cross-Cutting Model

Objective: To ensure the optimization of UICISA: E CCM and the fulfillment of all the obligations of an FCT-evaluated and funded research unit.

Resources: Strategies to ensure the quality of the procedures, monitor the organizational process, organize and protect productivity data, and monitor project implementation and the axes' synergy.

A checklist system was designed to keep the originality of the UICISA: E CCM and optimize its forces. The Unit's Coordinator uses this checklist on a regular system.

Points in the checklist to assess the system:

1. The UICISA: E database includes all the data on its researchers' productivity and those data were properly examined and validated.
2. The researcher's guide is updated and approved, and the researchers know the guide and act accordingly.
3. The management bodies have performed the duties foreseen in the bylaws.
4. The Structuring Projects are active and focused on the established priority topics.
5. The funded projects are properly implemented, both scientifically and financially, and its activities are strengthened with the resources provided by each Strategic Axis.
6. The clusters develop their activity in consistency with the UICISA: E bylaws and replicate the UICISA: E organizational model in their contexts and networks.
7. The team's annual productivity is equivalent to the number of researchers and the team develops R&D activities with quality and merit, assessed by international standards, taking into account the originality, consistency, rigor, and relevance of their contributions to knowledge advancement and application, and other interesting contributions to society.
8. The UICISA: E complies with all FCT requirements and demonstrates responsibility in the correct implementation of its plans and reports.

On the path

The UICISA: E affirms its brand image by leading new research paths in nursing, the science of care, both nationally and internationally. The team's vision is focused on the accreditation and funding of the processes promoting its CCM and the projects that generate knowledge value. To this end, its R&D activities are planned in line with the national political guidelines on knowledge, research, and innovation and the European Commission's proposal for the next Research Framework Program (2021 to 2027) through the three pillars: Open Science; Global Challenges and Industrial Competitiveness; and Open Innovation.

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