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REFLECTION

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Between technique and care: implications of using measurement instruments in nursing

Entre a técnica e o cuidado: implicações do uso de instrumentos de medida na enfermagem

Entre la técnica y el cuidado: implicaciones del uso de instrumentos de medición en enfermería

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Abstract

Objective: to reflect on the implications of using measurement instruments in health for nursing research and practice, considering the philosophy of technology and the fundamental patterns of nursing knowledge. **Method:** a theoretical-reflective study based on the analysis of the use of measurement instruments in light of Carper and Barnard, with three thematic axes constructed. **Results:** the reflection shows that although these instruments are fundamental to empirical knowledge, they affect and create tensions in the other patterns of nursing knowledge. From a humanistic perspective of the philosophy of technology, it is evident that measurement is not neutral and carries cultural, political, and ethical assumptions that shape practice and research. **Final considerations and implications for practice:** it is essential that nursing professionals use measurement instruments with technical mastery and critical reflection, integrating multiple patterns of knowledge to ensure ethical, aesthetic, and humanized care, especially so that the profession can contribute to achieving the Sustainable Development Goals.

Keywords: Knowledge; Nursing; Philosophy; Sustainable Development; Technology.

Resumo

Objetivo: refletir sobre as implicações do uso de instrumentos de medida em saúde para a pesquisa e prática em enfermagem, considerando a filosofia da tecnologia e os padrões fundamentais do conhecimento em enfermagem. **Método**: estudo teórico-reflexivo a partir da análise do uso dos instrumentos de medida à luz de Carper e Barnard, sendo construídos três eixos temáticos. **Resultados:** a reflexão evidencia que tais instrumentos, embora fundamentais ao conhecimento empírico, afetam e tensionam os demais padrões do conhecimento em enfermagem. A partir da perspectiva humanista da filosofia da tecnologia, identifica-se que a medição não é neutra e carrega pressupostos culturais, políticos e éticos que moldam a prática e a pesquisa. **Considerações finais e implicações para a prática**: é essencial que os profissionais de enfermagem utilizem os instrumentos de medida com domínio e reflexão crítica, integrando os múltiplos padrões do conhecimento para garantir um cuidado ético, estético e humanizado, especialmente para que a profissão possa contribuir com o alcance dos Objetivos do Desenvolvimento Sustentável.

Palavras-chave: Conhecimento; Desenvolvimento Sustentável; Enfermagem; Filosofia; Tecnologia.

Resumen

Objetivo: reflexionar sobre las implicaciones del uso de instrumentos de medición en salud para la investigación y la práctica en enfermería, considerando la filosofía de la tecnología y los patrones fundamentales del conocimiento en enfermería. **Método:** estudio teórico-reflexivo a partir del análisis del uso de instrumentos de medición a la luz de Carper y Barnard, construyéndose tres ejes temáticos. Resultados: La reflexión evidencia que dichos instrumentos, aunque fundamentales para el conocimiento empírico, afectan y tensionan los demás patrones del conocimiento en enfermería. Desde la perspectiva humanista de la filosofía de la tecnología, se identifica que la medición no es neutral y conlleva supuestos culturales, políticos y éticos que moldean la práctica y la investigación. **Consideraciones finales e implicaciones para la práctica:** es esencial que los profesionales de enfermería utilicen los instrumentos de medición con dominio técnico y reflexión crítica, integrando los múltiples patrones del conocimiento para garantizar una atención ética, estética y humanizada, especialmente para que la profesión pueda contribuir al logro de los Objetivos de Desarrollo Sostenible.

Palabras clave: Conocimiento; Desarrollo Sostenible; Enfermería; Filosofía; Tecnología.

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INTRODUCTION

The development of nursing as both a science and profession is embedded in a historical, social, economic, and cultural context that has been deeply shaped by technological advancement. This is evidenced, for example, by the growing use of health measurement instruments and the strengthening of digital health strategies, which aim to optimize work processes, expand access to health services, improve care indicators, and support clinical decision-making.

The use of measurement instruments is essential in the context of the Sustainable Development Goals (SDGs)[1] as they enable the production of scientific evidence, the assessment of health conditions, and the monitoring of interventions and health outcomes. These factors strengthen management and provide data for policymaking, thus contributing to the monitoring of the SDGs themselves.

Nevertheless, although such technologies promote benefits, they can also pose challenges to the human and subjective dimension of care, requiring a critical analysis of their uses, limitations, and ethical implications. While these technological forms are important in the composition of care, Merhy warns of the tendency for hard and soft-hard technologies to predominate at the expense of soft technologies in health policies and services. This undermines the potential of the expanded clinic and the humanization of care.[2]

The Brazilian Ministry of Health recognizes the growing role of technological innovation in healthcare and developed a strategy to integrate digital initiatives into the Unified Health System (SUS), promoting efficiency, safety, and equity. Its principles include the ethical and responsible use of technology, respect for individual autonomy, and the recognition of healthcare professionals as key agents of care.[3]

The intensive use of measurement instruments and digital resources needs to be discussed, as it can reduce care to a mechanistic, technical, and fragmented process. In this context, measurement instruments should not be understood merely as forms or assessment scales but as devices that translate subjective contexts into quantifiable formats, effecting an ontological transposition that can compromise the integrity and wholeness of human phenomena.

This transposition entails significant epistemological and ethical risks. The philosophy of technology, particularly its humanities strand, offers a fruitful interpretative key to this discussion. Authors such as Barnard (2002) emphasize that technology, far from being neutral, modulates human experience, influencing how individuals constitute themselves, how they care for themselves, and how they care for others.[4] In this sense, an analysis that goes beyond the functionality of measurement instruments and integrates a critical perspective on their effects on professional practice and on the ontology of care itself is needed.

From this perspective, the connection with the fundamental patterns of nursing knowledge, proposed by Carper (1978), allows us to understand how such instruments, although belonging to the domain of empirical knowledge, impact other patterns—ethical, aesthetic, and personal. These patterns form the epistemological foundation of nursing, enabling a holistic and sensitive understanding of the human experience in health.[5,6] Carper and Barnard converge in their critique of technical reductionism and the hegemony of instrumental rationality in healthcare.[4,5]

Furthermore, it is necessary to recognize that the very epistemology underlying the use of these instruments is in dispute. Positivism, which historically underpins the idea of objectivity and neutrality in measurement, has been criticized for its inability to capture the complexity of human phenomena. In contrast, constructivism emphasizes the intersubjective dimension of knowledge, proposing that reality and knowledge are socially constructed. However, the proposition of constructive realism, as discussed by Durepos et al.,[7] emerges as an integrative approach: it assumes that an objective reality exists, but can only be known through human constructions—cultural, historical, and technical. This perspective maintains that measurement instruments can offer valid knowledge, provided they are critically integrated with other patterns of knowledge.

The problem outlined is anchored in the need to understand such instruments not only as operational tools but also as meaning-producing technologies, whose implications extend beyond the technical domain to encompass ways of knowing, caring, and relating in the field of nursing. Therefore, this study aims to reflect on the implications of using health measurement instruments for nursing research and practice, considering the philosophy of technology and the fundamental patterns of nursing knowledge.

METHOD

This theoretical and reflective study was guided by two main references: the fundamental patterns of knowledge in nursing as proposed by Carper (1978),[5] and the contributions of the philosophy of technology, particularly the critical perspective of the humanities, as discussed by Barnard (2002).[4]

The reflective process involved problematizing the reality of instrument use in healthcare through the lens of selected frameworks, with the aim of understanding how their use can be redefined in light of a broader, multidimensional understanding of nursing knowledge and the philosophy of technology. This process was conducted systematically in three stages: 1) selection of theoretical frameworks; 2) organization of ideas and definition of the analytical axes; and 3) development of the reflective path.

During stage 1, Carper and Barnard were chosen for their relevance in understanding, respectively, the multiplicity of nursing knowledge patterns and the critical and cultural nature of technologies in healthcare practice. The selection considered the established influence of these authors in the literature and the relevance of their contributions to critiquing the use of measurement instruments.

In stage 2, the structure of the reflection was defined around three thematic axes: Fundamental Patterns of Nursing Knowledge: Between Technique and Care; Technology, Care, and Critical Consciousness: Connections between the Philosophy of Technology

and Nursing Praxis; and Health Measurement Instruments as Technology: Epistemological, Ethical, and Aesthetic Implications for Nursing. These axes were defined through a critical analysis of the interactions between knowledge patterns and the philosophy of technology, with the aim of highlighting how measurement instruments impact multiple dimensions of care.

In the final stage, the analysis focused on critically examining the use of instruments in nursing practice and research by connecting the selected frameworks and exploring their points of convergence. This process identified the epistemological, ethical, aesthetic, and personal impacts of these instruments, fostering a broader and multidimensional understanding of professional knowledge and practice.

RESULTS AND DISCUSSION

Fundamental patterns of nursing knowledge: between technique and care

Carper's (1978) proposition to understand nursing knowledge through four fundamental patterns—empirical, aesthetic, personal, and ethical—marked an epistemological shift in the nursing profession, breaking with the hegemony of positivist scientific knowledge as the only legitimate way to validate practice. Each of these patterns represents a distinct yet interdependent way of understanding the world and situating oneself in relation to health care, giving nursing an epistemologically plural character.[5]

Empirical knowledge corresponds to the science of nursing, grounded in theories, evidence, and observable data. It reflects the search for regularities, causal explanations, and the predictability of phenomena related to health and care.[5] This understanding of the empirical pattern as scientific and technical knowledge is also supported in the literature.[8]

This pattern converges with the positivist view of science, which is widely reflected in other disciplines, and serves as a criterion for determining whether a discipline can be defined as a science. Within this framework, health measurement instruments are inscribed as expressions of technical-scientific rationality. However, it is important to note that this pattern, while necessary, is insufficient on its own, as it does not capture the integrity and wholeness of human experience.[8]

Aesthetic knowledge, in turn, refers to the art of care. It is anchored in the ability to grasp the singularity of lived situations, to recognize unspoken patterns, to "know what to do" even facing complexities and uncertainties. This form of knowledge reveals itself through sensitivity, intuition, and the creation of situated responses.[5] This pattern directly challenges the use of standardized instruments, as aesthetic care is not confined to the application of protocols but arises from empathic relationships and understanding.

Empathy is embodied in this form of knowledge and is important for understanding individuals' singular experiences. It encompasses the perception of the unique, often abstract, characteristics of each person, emphasizing singularities rather than universalities. By perceiving and cultivating empathy with the way others live, nurses gain deeper knowledge and understanding of different realities, thereby increasing their possibilities for effective care choices.[5]

From Madureira's (2004) perspective, it is a subjective, unique, individual, and singular knowledge, linked to the acceptance of the existence of objects and phenomena that cannot be quantified or explained by previously formulated laws and theories. In this sense, aesthetic knowledge can be understood as referring to the way care presents itself to the perception and experience of the other.[8]

Personal knowledge concerns the subjective and relational dimension of care. It involves the professional's self-knowledge, openness to the experience of others, and recognition of intersubjectivity as a foundational aspect of care. In this sense, the use of measurement instruments—often impersonal and systematized—can obscure or even silence this dimension if adopted uncritically.[5] It is therefore necessary to consider how such instruments affect the encounter between subject and caregiver.

Ethical knowledge, on the other hand, entails a critical stance toward the moral situations that permeate care. It involves discernment, responsibility, and commitment to values such as justice, autonomy, equity, and human dignity.[5] The adoption of a measurement instrument, even if scientifically validated, must be assessed in light of ethical standards: whom does it serve? Which individuals does it recognize or overlook? What forms of suffering does it make visible or exclude?

Authors such as Chinn and Kramer (2008) expanded this framework by proposing an emancipatory pattern of knowledge, aimed at denouncing injustices and transforming the social structures that perpetuate inequities. This pattern calls on nursing to connect knowledge and action, theory and praxis, challenging the apparent neutrality of many technologies used in healthcare.[9] Thus, the use of measurement instruments must also be questioned with regard to their role in the reproduction (or subversion) of inequities, invisibilities, and institutional normativities.

By recognizing the coexistence of these patterns, it becomes clear that nursing knowledge is multiparadigmatic, constructed at the intersection of science, art, experience, and ethics. Therefore, the adoption of a measurement instrument cannot be a neutral or purely technical action, but must be situated within the interplay of these forms of knowledge. At this point, philosophical reflection becomes a critical tool to ensure that the use of technology—in this case, measurement instruments—does not displace or obscure other dimensions of care.

Technology, care, and critical consciousness: connections between the philosophy of technology and nursing praxis

The incorporation of technologies in the health field, and specifically into nursing, requires a perspective that goes beyond functionality and efficiency. Barnard (2002) argues that the philosophy of technology provides a critical and reflective tool for understanding how technical devices influence not only modes of care but also the very epistemological and ontological foundations of nursing.[4]

The notion of "technology" is often understood narrowly, as the simple application of artifacts or technical procedures. However, Barnard argues that technology is a cultural, social, and historical construct, encompassing not only objects but also systems of knowledge, practices, and power relations. It is a polysemous and ambiguous concept, whose understanding requires moving beyond common sense and adopting a philosophical stance.[4]

The philosophy of technology, as an autonomous field, is relatively recent. Although influenced by classical traditions—such as Platonic idealism, which viewed technology as an imperfect imitation of the ideal form—its establishment as a critical field dates back to the 20th century, particularly with authors such as Karl Marx, who denounced the alienation promoted by industrial technology, and Ernst Kapp, who coined the term "philosophy of technology" in his effort to understand the technical extensions of the human body. The outbreak of world wars, with the massive use of destructive technologies, underscored the need to rethink the links between technology, humanity, and ethics.[4]

Two major interpretative avenues emerge in the philosophy of technology: the engineering perspective and the humanities perspective. The former adopts an essentialist and functional stance, viewing technology as a neutral and rational tool, detached from human experience. This approach emphasizes problem-solving, efficiency, and technical control, while the ethical or existential implications of technology are often relegated to the background or treated reactively.[4]

The humanities perspective, on the other hand, offers a more critical and contextualized view. Within this perspective, substantivism and social constructivism gain prominence. Substantivism—associated with authors such as Heidegger and Ellul—conceives of technology as an autonomous force, capable of shaping values and relationships, even in alienating ways. Social constructivism, in contrast, rejects technical neutrality, asserting that all technology is socially constructed and carries the interests and worldviews of its designers and users. From this standpoint, technology is an ideologically charged phenomenon, implicated in the maintenance or subversion of social structures.[4]

Nursing, as a practice situated in highly technological contexts, is not exempt from these dynamics. On the contrary, nursing professionals often occupy a liminal position—between technical mediation and human encounter, between empirical knowledge and attentive listening. Barnard (2002) notes that nurses, even without explicit reflection on technology, are continually making choices that involve complex articulations among devices, subjects, and clinical contexts.[4]

This relationship is not without its tensions. On the one hand, the incorporation of sophisticated technologies can expand diagnostic capacity, predict risks, monitor signals, and streamline processes. On the other hand, it risks obscuring the uniqueness of the human experience, reducing care to a technical execution. Technology, when used without critical awareness, can dehumanize and alienate, turning the patient into an object of control rather than a subject of care.

It is precisely at this point that the philosophy of technology, especially its humanistic aspect, offers an indispensable space for reflection for nursing. It invites us to consider how, why, and for whom certain technologies are used. In doing so, it reaches the core of the profession's ethical and epistemological practice. Barnard argues that nurses must develop a "technological consciousness"—a critical understanding of the role of technologies in shaping care, relationships, and nursing knowledge itself.[4]

Such consciousness implies recognizing that all technology carries within it concepts of body, health, normality, and value. Therefore, nursing requires not only technical mastery but also an ethical-political stance in response to the transformations that technologies produce in ways of being, caring, and coexisting. In this scenario, care cannot be reduced to a technical performance; it must preserve its relational, symbolic, and ethical depth.

Health measurement instruments as technology: epistemological, ethical, and aesthetic implications for nursing

It is necessary to make some critical considerations about the implications of the use of health measurement instruments in nursing practice and research. This discussion requires the articulation of the fundamental patterns of nursing knowledge, as proposed by Carper (1978),[5] and contemporary approaches to the philosophy of technology, especially in its humanistic strand[4]

The first relevant observation is that measurement instruments are, by definition, technologies. Although often treated as neutral and merely operational tools, their presence in daily nursing requires a broader and more critical understanding. They not only quantify aspects of health and human behavior but also mediate relationships, shape interventions, and define what can be considered relevant or measurable in care. In this sense, they integrate the corpus of empirical nursing knowledge while simultaneously challenging its other epistemic dimensions.[5]

The exclusive emphasis on measurement, especially from a positivist and reductionist perspective, risks silencing or marginalizing aesthetic, ethical, and personal knowledge.[5] Measurement in nursing is often criticized for three fundamental reasons: (i) it tends to operate through mechanistic approaches that drain phenomena of their meaning; (ii) it presupposes an illusory objectivity, disregarding the human biases involved in its construction and application; and (iii) it promotes generalizations that disrespect the uniqueness of subjects.[10]

Rolfe (2015) warns of the risks of an excessively evidence-based approach to nursing, especially when the validity of instruments whose validity is taken for granted. He argues that such an approach disregards nursing as a human science centered on people and compromises the quality of care by privileging a rationalist and technical model derived from the biomedical and social sciences, which is not always compatible with the existential complexity of health care.[11]

In this context, the philosophy of constructive realism offers a fruitful alternative. By recognizing that reality can be measured without disregarding its historical and intersubjective construction,

this perspective legitimizes the use of measurement instruments as a relevant epistemological tool, without, however, absolutizing them. In this sense, Durepos et al.[7] argue that measurement can contribute positively to the development of empirical knowledge in nursing, provided it is understood as a means rather than an end.

Furthermore, it is imperative to recognize that measurement instruments impact all patterns of knowledge. From an ethical perspective, it is necessary to address the dilemmas involved in the selection, application, and interpretation of these instruments. Which measures should be prioritized? Which aspects of human experience should be quantified, and which left aside? How can we ensure that the data produced respect the dignity and autonomy of the subjects involved?

On an aesthetic level, the challenge lies in preserving the uniqueness of care, even in the face of the standardization inherent in measurement instruments. Aesthetic sensitivity requires nurses to recognize the nuances of suffering, the body, and the narrative of others, rather than limiting themselves to what can be measured. On a personal level, measurement should not obscure the construction of authentic and empathetic relationships. On the contrary, it is both possible and desirable for measurement to serve as a bridge to human encounter, not a barrier.

As technologies, measurement instruments must also be subject to philosophical critique. From a humanist perspective, the philosophy of technology invites us to examine the political, cultural, and epistemological implications of these tools. The ways nursing employs them—whether in care practice or in knowledge production—directly affect its professional identity and ethical commitments.

Therefore, it is necessary to train nurses with the critical capacity to evaluate the assumptions underlying the instruments they use. This includes understanding what is being measured, why it is being measured, and the consequences of this choice. As Durepos et al.[7] argue, the reflective use of measurement strengthens the empirical pattern of knowledge while supporting more comprehensive and ethical care. Furthermore, integrating quantitative and qualitative methods offers a powerful strategy for deepening the understanding of phenomena relevant to nursing.

It is worth noting that technique and care are sometimes viewed as opposing concepts, yet they are in fact intertwined in the human condition and embedded in the "doing" of nursing. In this sense, the relationship between care and technification is complex and calls for an approach that recognizes not only the technical but also the ethical, aesthetic, and personal dimensions of care. Technology enables care, while care guides the use of technique and technology in an ethical, responsible, and sensitive manner. Thus, technique and technology can be understood as ontological elements that expand the possibilities of professional practice.[12]

The theoretical and epistemological complexities of nursing make it particularly susceptible to external technological influences, which do not always align with the ethical and humanistic principles of the profession.[13] However, from a humanities perspective, technology should be understood as a mediation between the human and the technical, significantly shaping the practices and possibilities it enables. It is therefore urgent to overcome the historical ambivalence between nursing and technology.[14]

In this scenario, innovation does not compromise sensitivity; on the contrary, it is sensitivity that enables truly meaningful innovation. By reinterpreting the myth of care and incorporating technology into human ontology, care can guide and orient technological action without losing its ethical, relational, and human dimensions. In this way, care remains an essential condition of existence, including its expression in the technical and technological spheres.[12]

It is therefore proposed that measurement instruments be applied in research with well-defined purposes and with absolute respect for the individuals involved. Ethical sensitivity entails not only to informed consent but also attentive listening, consideration of the study's repercussions, and a commitment to transforming the reality under investigation. Finally, in clinical practice, measurement can enrich care combined with other patterns of knowledge. Nursing care requires more than technical precision; it also requires ethical discernment, aesthetic sensitivity, and personal connection. By recognizing that instruments are technologies, the philosophy of technology challenges us to engage with both their strengths and limitations.

FINAL CONSIDERATIONS AND IMPLICATIONS FOR PRACTICE

More than technical tools, measurement instruments are technologies of care that shape relationships and define what is considered measurable in human experience. Therefore, it is necessary to critically examine their apparent neutrality and recognize their symbolic, political, and historical implications. The philosophy of technology contributes to a critical approach to these instruments, encouraging their conscious use—one that values objectivity while remaining attentive to the subjective and relational complexity of care. In this context, constructive realism offers a theoretical path to balance evidence and ethical sensitivity.

To contribute to the SDGs, nursing education must prepare professionals not only to apply instruments but also to understand their foundations, purposes, and limitations. Integrating quantitative and qualitative approaches enables more robust responses to the demands of practice. Thus, the critical and contextual use of instruments strengthens nursing as both a science and a practice committed to comprehensive, ethical, and humanized care—core values for achieving the 2030 Agenda.

This study sought to critically reflect on the use of measurement instruments in nursing, drawing on the frameworks proposed by Carper and Barnard. However, the limitations inherent to the theoretical-reflective approach adopted are acknowledged. Interpretation anchored in specific frameworks entails a certain degree of subjectivity and epistemological delimitation, as well as restrictions in theoretical scope and consideration of other theoretical-philosophical perspectives. Furthermore, the lack of empirical evidence limits generalization and practical applicability.

In addition, the frameworks adopted are rooted in specific historical contexts, which may reduce their relevance to contemporary demands. These limitations, however, do not invalidate this study's potential to provoke new questions and inform future discussions on the meanings and implications of using measurement instruments in nursing care.

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The contents underlying the research text are included in the article.

CONFLICT OF INTEREST

No conflict of interest declared.

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