ORIGINAL ARTICLE

Reassembling nursing in the digital age: An actor-network theory perspective

Matthew Wynn 🟢 | Lisa Garwood-Cross

School of Health and Society, University of Salford, Salford, UK

Correspondence
Matthew Wynn, School of Health and Society, University of Salford, A.111, Allerton Bldg, Salford M6 6PU, UK.
Email: m.o.wynn@salford.ac.uk

Abstract

This article explores the application of actor-network theory (ANT) to the nursing profession, proposing a novel perspective in understanding nursing in the context of modern digital healthcare. Traditional grand nursing theories, while foundational, often fail to encapsulate the dynamic and complex nature of nursing, particularly in an era of rapid technological advancements and shifting societal dynamics. ANT, with its emphasis on the relationships between human and nonhuman actors, offers a framework to understand nursing beyond traditional paradigms. This article makes two key arguments: first, that nursing can be viewed as a highly organised social assemblage, where both human (nurses, patients and policymakers) and nonhuman actors (technologies, medical equipment, institutional policies) play a crucial role, and second, that ANT can be used to enhance existing nursing theory to better understand the role of technology in nursing practice. The article considers how ANT can provide a more holistic and adaptable model for describing the nursing profession, particularly in an era where technology plays an integral role in healthcare delivery. It discusses the implications of viewing nursing through ANT, highlighting the need for nursing education and practice to adapt to the interconnected and technologically advanced nature of modern healthcare. The article also acknowledges the limitations of ANT, particularly its potential over-simplification of the complex ethical dimensions inherent in nursing and its focus on observable phenomena.

KEYWORDS
actor-network theory, ANT, digital, digital health, education, nursing, technology, theory

1 | INTRODUCTION

In the evolving landscape of healthcare, the meaning of work for nursing has been the subject of ongoing debate and is currently a recommended focus of research by the Royal College of Nursing (RCN) (2020). Traditional nursing theories, for example, Jean Watsons theory of human caring, Dorothea Orem's self-care deficit theory or Madeleine Leininger's theory of cultural care diversity and universality, while foundational, often fall short in encapsulating the profession's unique knowledge base and the multifaceted role that nurses play in contemporary healthcare settings. These theories, primarily grounded in human-centric and practice-oriented

perspectives, lack the breadth to fully account for the dynamic and complex nature of nursing, particularly in the face of rapid technological advancements and shifting societal dynamics. Nursing has long been the subject of speculation and investigation with regard to whether it has a truly unique epistemology or indeed if it qualifies as a 'profession' in the traditional sense (Collier-Sewell et al., 2023; Messer, 1914). Recent evidence also indicates incongruous perceptions of nursing between the public and nurses, and that nurses' professional identities may be influenced directly by public perceptions (Ten Hoeve et al., 2013). Efforts to synthesise nursing theoretical concepts to establish a coherent metaparadigm (Fawcett, 1984) for the profession have also been met with criticism from within the profession (Bender, 2018). More recently, efforts to identify a clear theoretical basis for nursing practice and research have been characterised as 'mundane' by Thorne (2023), who argues that more open philosophical enquiry is, and should be, of robust interest in the current era. Unfortunately, the ongoing lack of epistemic clarity in nursing may leave nurses uniquely vulnerable in a healthcare system that is subject to numerous challenges. These challenges include global ageing, the digitalisation of healthcare environments, working conditions such as understaffing and declining salaries and the increasing medicalisation of nursing practices. The digitalisation of nursing, involving integration of robotics and artificial intelligence, among other technologies, appears to be generating a crisis of purpose and identity among student nurses (Wong et al., 2023). In a recent study, Wong et al. (2023) explored preregistration students' perceptions and concluded that nurse educators should 'prepare students to redefine their nursing identity' and called for 'a paradigm shift of what nursing is in a digital world' (p. 1). These sentiments, reflecting the concerns and challenges highlighted by the next generation of nurses, indicate the need for greater thinking about how nursing might be affected by ongoing technological innovations.

The issues with the medicalisation of practice are clearly evidenced by the proliferation of 'advanced practice' roles now increasingly common in many countries, within which nurses prescribe medicines, perform differential diagnosis and in some cases perform surgery (Wheeler et al., 2022). These roles are undeniably grounded in the medical model and, although arguably not incompatible with nursing theories, are inconsistent with many, if not most, people's conception of what nursing is, specifically, that nurses are typically not the people you see for a differential diagnosis and medical treatment plan. While efforts have been made to delineate the unique nursing contribution that nurses in these roles provide, they suggest that the roles indicate a 'reconstruction of nursing identity' or lean on the concept of 'care' as being a unique contribution of nurses in advanced roles (Kennedy et al., 2015). This latter point is contentious due to the varying conceptions of care, and notable critique of this as a basis for nursing practice in any context, let alone as a differentiator between 'advanced' nurses and doctors (Crigger, 1997; Paley, 2002). Despite these claims of a unique contribution, numerous studies have been undertaken directly comparing the economic implications of using advanced practice nurses undertaking roles traditionally performed by doctors (Abraham et al., 2019; Martin-Misener et al., 2015), which strongly indicates that at least some scholars consider these roles to be entirely comparable in relation to the value that they add to healthcare services and that the roles 'advanced nurse practitioner' and 'doctor' are effectively interchangeable.

Nurses in these advanced roles are unlikely to receive the same remuneration as their medically trained colleagues practising the same roles, indicating the potential of confusion around the unique offering of nursing to create further challenges for nurses in relation to salary and working conditions. In a debate among nursing leaders in the United Kingdom, a diversity of thought was noted among leaders around the implications of these roles (Nadaf et al., 2018). Speakers in the debate expressed that these advanced roles are potentially a reflection of healthcare demands and medical workforce shortages; may represent an end to the primacy of medicine; that gender may influence the willingness of nurses to celebrate their own expertise; and that nurses need to be careful not to lose their identity in the face of advanced practice roles (Nadaf et al., 2018). Without a robust understanding of *what* nursing is, or *how* it might change in the face of a changing healthcare landscape, nursing is at risk of being buffeted on the winds of change as dictated by political and medical need rather than the coherent analysis of 'nursing' needs as identified by leaders of the profession.

The challenge in defining and understanding the unique contribution of the nursing profession is not that there is any question over the value of nurses, but rather that the contribution that nursing makes to healthcare systems is so expansive that the complex, integral roles provided by nurses are often oversimplified to a minimised construct of 'caring'. Therefore, in this article, we propose the use of actor-network theory (ANT) (Latour, 2005) as a tool for nursing scholars, which allows the investigation of large, complex social phenomena by tracing the connections between the actors who assemble to create the phenomena, enabling the deconstruction of assumptions about what nursing is. In doing so, we expand the consideration of nursing past the traditional construct of a profession, which is separated through a clearly defined unique body of knowledge and expertise, and consider how nursing goes beyond this, as a highly organised social assemblage focussed primarily on the improvement of health outcomes.

Approaching nursing from this sociological point of view provides an opportunity to develop further understandings of nursing practice and develop robust considerations of the critical role of nurses in an ever-changing healthcare landscape. While ANT is not the only sociological perspective with which to explore or understand the nursing profession, the authors consider it the most appropriate in the context of a profession undergoing digitisation, given the theory's origins in science and technology studies and consideration of technology, and other nonhuman actants in shaping and being shaped by individuals, a concept typically absent from traditional nursing theories. This focus on technology is consistent with contemporary theorising in nursing, best reflected in the recent

suggestion that technology itself should be considered a metaparadigm concept in nursing (Bayuo et al., 2023).

This paper will begin by introducing the core principles of ANT, before contextualising ANT in a nursing context through the use of two dynamic vignettes. Following this, the authors make an argument for the expansion of nursing theory in the digital age to reassemble our view of the integral work of nursing and how nurses engage with technologies.

2 | THE PRINCIPLES OF ACTOR-NETWORK THEORY

ANT is an approach to describing sociological phenomena and was developed by scholars including Latour (2005), Callon (1984) and Law (1992). ANT offers a framework for understanding nursing beyond the confines of traditional paradigms or potentially overly simple theoretical models. ANT is both a theoretical and a methodological approach used in social theory and research, originating in the field of science and technology studies (STS). The theory views both human and nonhuman 'actors' as equally important in the creation of social networks or the 'assemblage' of a phenomena. Its key tenets can be seen in Table 1.

3 | ACTOR-NETWORK THEORY IN NURSING: VIGNETTES

To understand how ANT, and its related principles, can be used to view nursing practices, this section of the paper presents two fictional vignettes. These vignettes provide differing examples of the application of ANT, the first in a close-up clinical nursing context and the second by zooming out to the level of the profession.

Vignette 1. An example of ANT applied in a clinical nursing context.

In the busy environment of a hospital ward, the care of a patient named Emma unfolds as a vivid illustration of ANT in nursing practice. This narrative reveals the intricate interplay of diverse actors, both human and nonhuman, each contributing to the tapestry of her care.

At the centre of this network is Emma, whose unique health condition and personal background are pivotal in shaping the network's dynamics. Surrounding her are the human actors: the nurses, who serve as the linchpins of care, the doctors, with their specialised knowledge, and Emma's family, providing emotional support and personal insights.

The nonhuman actors in this network are no less influential. The intravenous drip administering medication, the beeps of the heart monitor, the electronic health records – each plays a critical role. These elements are not mere backdrops to human activity; they actively participate in the care process. The heart monitor's readings, for instance, guide the nurses' decisions, just as the layout of the hospital room influences the ease of interaction among the actors.

ANT principles come to life in this setting. Heterogeneity is evident in the diverse array of actors, both living and inanimate, each a crucial piece of the puzzle. Symmetry in ANT's lens is reflected in how the contributions of a nurse's expertise are seen as equally pivotal as the reliability of the medical equipment. Each actor, regardless of its nature, holds equal weight in the network.

The principle of translation is vividly demonstrated as nurses mediate between Emma's expressed needs and the doctors' medical directives. They translate medical jargon into understandable language for Emma's family, ensuring that care decisions are made collaboratively and informedly. This translation is not just linguistic but also involves aligning the diverse interests and capabilities within the network to ensure Emma's optimal care.

TABLE 1 The key concepts of actor-network theory (ANT).

Key concept	Description
Agency of Nonhumans	ANT argues that nonhuman entities (like technologies, objects, ideas) have the ability to shape, impact and influence social relations just as humans do.
Networks of relations	ANT emphasises that society and technology are constituted by networks of relations between diverse entities, both human and nonhuman.
Heterogeneity	ANT is characterised by its focus on the heterogeneity, or diversity, of actors involved in these networks. It does not prioritise human actors over nonhumans or vice versa and recognises that each actor brings variety to the assemblage.
Symmetry principle	ANT applies the same analytical framework to both human and nonhuman actors, avoiding any a priori distinctions between 'natural' and 'social' elements of the network.
Translation	This concept refers to the process by which actors negotiate, align and enlist others into their network, transforming their diverse interests into a direction that serves the network.
Fluidity and dynamism	ANT views networks as not static but dynamic, constantly being made and remade through the actions and influence of actors.
Resistance to reductionism	ANT resists reducing the explanation of social phenomena to either purely social or purely technical factors.

In this narrative, Emma's journey through the healthcare system is more than a series of medical interventions. It is a dynamic dance of actors, human and nonhuman, constantly interacting, negotiating and reshaping the network of her care. This ANT perspective illuminates the complexity and interdependence of elements in healthcare, offering a deeper understanding of the nuances involved in patient care.

Vignette 2. An example of ANT applied at the level of the profession.

The professional trajectory of Nurse Amina, specialising in neurology, exemplifies the application of ANT within the nursing discipline. Through her career, which spans various healthcare settings, Amina's innovative adaptations to challenges illuminate the principles of heterogeneity, symmetry and translation as proposed by ANT, thereby portraying the nursing profession as a dynamic and interconnected network.

Amina's tenure commenced within the neurology department of an urban hospital, characterised by its diverse assemblage of actors. This environment included patients with neurological disorders, a team of healthcare professionals with specialised expertise and numerous nonhuman actors, such as state-of-the-art neuroimaging technology and electronic health records. This scenario epitomises the ANT notion of heterogeneity, where human and nonhuman actors are intertwined within a network, each contributing indispensably to the overarching goal of patient care. The integration of these actors, from the precision of diagnostic equipment to the empathetic patient interactions, underscores the network's complexity and collaborative nature.

The advent of the COVID-19 pandemic necessitated a significant adaptation in Amina's practice, including initiation of telehealth services for neurology patients and the innovative use of a secure platform for patients to upload videos of their seizures. By leveraging technology to maintain patient care continuity, Amina demonstrated the integration of human expertise and technological innovation, ensuring effective communication and care delivery despite physical distancing constraints put in place by governmental actors by utilising telehealth technologies.

When Amina relocates to a remote rural clinic, she identifies new complex actants that impact her patient care. Some of her patients have been missing clinics due to the area's poor and infrequent bus services. Amina suggests that she offer video appointments as she did in her previous hospital; however, the poor Wi-Fi infrastructure in the rural clinic presents barriers to offering this service. Instead, Amina adapts her practice by offering telephone consultations, which are popular with her patients as they no longer need to pay for transport or take time off of work to make the longer journey to the clinic. Her response exemplifies the principle of translation inherent in ANT. Through these strategies, Amina effectively negotiated the discrepancies between her patients' needs and the available resources, aligning her neurology practice with the specific healthcare context of her rural setting.

This account of Nurse Amina's career, through the analytical lens of ANT, reveals the nursing profession as an intricate network of interdependent actors, both human and nonhuman. Her narrative highlights the profession's adaptability, complexity and interconnectedness, providing a profound insight into nursing as a field continually shaped by a myriad of actors and influences. Amina's journey thus offers a compelling illustration of ANT's application within nursing, demonstrating the theory's relevance in understanding and navigating the multifaceted landscapes of healthcare practice.

By positioning nursing as a network of interactions and relationships that encompass both human and nonhuman actors, ANT provides a holistic and adaptable model for describing the profession. Digital tools and platforms, from electronic health records to telehealth services, are not mere adjuncts to nursing practice but are active participants in the care process. The impacts of nondigital technologies including new medicines, diagnostic processes and the general increase in medical scientific knowledge over the past century have also undoubtedly impacted on the roles of nurses. This arguably accounts for the creep of nursing roles to include traditionally medical roles such as prescribing medicines, to facilitate the ongoing advancement of medical science without creating untenable demands on the time of doctors. ANT offers an opportunity to describe these influences where traditional nursing theory cannot. Furthermore, nursing as a sociological phenomenon extends beyond the individual nurse–patient interaction. It is influenced by a plethora of actors, including hospital policies, gender dynamics, global ageing trends and economic disparities. Changing the way we theorise nursing to recognise these will provide clearer understanding of the challenges and realities of the nursing profession. These elements, overlooked in traditional nursing theories in their conception of nursing practice, are crucial in understanding why nursing exists as a profession and how its practices are defined and refined over time. These extrinsic factors are sometimes considered to be separate from the fabric of nursing itself and instead as mere artefacts of the society outside of the profession, for example, the perceived impacts of stereotypes influencing the gender distribution of the profession (RCN, 2020). By considering these concepts instead as 'actors' exerting agency within a wider network encompassing nursing, nurses and the respective links to wider society and allied professions, we might better understand why nursing is the way it is, and how to ensure it is treated equitably in future, as nurses often find themselves being spread thin to address these peripheral things in the care of their patients.

ANT has been utilised already in the study of technologies in nursing practice, for example, for informing nursing research methodology (Booth et al., 2016) and in the context of mental health nursing practice (Balfe, 2024). However, it has yet to be considered as a means to view the profession as a whole or as a potential supplement to traditional nursing theories either by helping to situate them 'within' the network or by imbuing them with a refreshed and technologically sensitive ontology. It is important to consider that ANT, unlike typical theories, does not seek to provide explanation or predict events. In this sense, it is more akin to an ontological perspective on the social rather than a theory in the normal sense. Instead, Latour (2005) invites users of ANT to seek to describe networks carefully and richly.

4 | LIMITATIONS AND ROLE OF TRADITIONAL NURSING THEORIES

Traditional nursing theories have played a crucial role in shaping the practice and education of nursing over the years and supported professionalisation. These theories have provided a framework for understanding the role of nurses, patient care dynamics and the healing process. However, as healthcare enters an era marked by rapid technological advancement and complex socioeconomic challenges, these traditional theories have limitations in fully capturing the essence and scope of contemporary nursing. One of the primary limitations of traditional theories is their predominant focus on human-centric care. The 'person' is one of the four metaparadigm concepts, the other three being the environment, health and nursing (Fawcett, 1984). These theories emphasise the interactions and relationships between nurses and patients, often neglecting the broader context in which these interactions occur. While the human element is undeniably central to nursing, this perspective overlooks the increasing role of nonhuman actors, such as technology, in shaping nursing practices. For example, there is increasing evidence of patients using online sources to find health information (Kubb & Foran, 2020; Thorne, 2023; Wang et al., 2021) and organise themselves into patient communities (Fayn et al., 2021). It has long been argued that ideally, no one 'wants' a nurse looking after them (as this implies ill-health and dependence); in the case of digital and highly networked technologies that allow care to be entirely separated from any human presence, traditional conceptions of human-centricity may become lost (Liang et al, 2019). Without adequate consideration and exploration of the ways in which these technologies currently, and might feasibly, impact on the nature of relation between nurses and patients, it is challenging to identify how nursing might fully adapt and prepare future nurses for these new digital environments.

With the advent of digital innovations, the landscape of healthcare has transformed dramatically. Traditional nursing theories, however, have been slow to integrate these technological advancements into their frameworks. This lag results in a gap between theory and practice, leaving nurses underprepared to effectively utilise and interact with these new tools in their practice. This is best evidenced by nurses' potential rejection of these technologies in some instances on the grounds that they are not considered congruent with the concept of 'care' itself (Pepito et al., 2023; Robichaux et al., 2019), a key concept within many traditional nursing theories.

The societal context in which nursing operates has also evolved, marked by factors such as global ageing, economic disparities and shifting gender roles within the profession. Traditional theories, with their roots in historical contexts, often fail to address these contemporary issues adequately. This limitation hinders the ability of these theories to provide guidance on navigating the complex social and economic challenges that modern nurses face. The impacts of gender have long been known in nursing and have been well documented in robust studies on the issue (Davies, 1995; RCN, 2020). However, despite the well-established 'femininity' of the profession and its attendant influences on practice, including the adoption and use of technology (Wynn, Garwood-Cross, Vasilica, Griffiths, et al., 2023), the concept of gender is seldom considered in any existing nursing theory as a relevant concept that might influence practise itself.

In summary, while traditional nursing theories have laid the foundation for nursing practice, their limitations become increasingly apparent in the context of modern healthcare. These theories struggle to describe or predict the full scope of nursing in an era defined by technological integration and complex social dynamics. This gap underscores the need for a new theoretical approach that can encompass the multifaceted and evolving nature of nursing—a role that ANT may fulfil.

5 | RECONCEPTUALISING NURSING THROUGH ANT

The application of ANT to nursing reveals a complex tapestry where human and nonhuman actors intertwine to shape the profession and its practices. This approach moves beyond viewing nursing simply as a collection of individual skills and interactions or static concepts of interest (i.e., holism-, care- or evidence-based practice), presenting it instead as a dynamic assembly formed by the continuous interplay of diverse elements within a broader healthcare network.

Central to this network are the interactions between human actors (nurses, patients and policymakers) and nonhuman actors (technologies, medical equipment, institutional policies). These interactions are not unidirectional; rather, they involve a reciprocal influence that continually reshapes the nursing landscape. For instance, the integration of advanced digital systems into healthcare—a nonhuman actor—changes not only the technical aspects of nursing practice but also influences nurse–patient dynamics and interprofessional collaboration. The adaptation of nurses to these systems, in turn, can lead to further technological modifications and policy adjustments, creating a cycle of mutual influence and adaptation. This interconnectedness is particularly evident when considering the role of technology as a catalyst in

transforming nursing practices. Technological advancements, such as telemedicine and digital health records, extend the capabilities and reach of nursing care, necessitating an evolution in nursing roles and methodologies. These technologies do not merely support existing practices; they redefine them, altering the essence of patient–nurse interactions and the parameters of nursing care. Similarly, policy changes and economic conditions within the healthcare sector act as significant driving forces. For example, shifts in healthcare funding or the introduction of new patient care protocols not only impact the practical aspects of nursing but also influence the ethical and decision-making frameworks within which nurses operate.

This perspective highlights the value of viewing nursing through the lens of ANT, which acknowledges the multifaceted nature of the profession and its capacity to adapt and evolve within an ever-changing healthcare landscape. Whereas Thorne (2023) has argued that freeing the profession from the constraints of theory may allow greater focus on philosophising around the nature of nursing, we argue that this is best accompanied by a frank analysis of nursing from the perspective of ANT. Unlike typical theory, ANT does not seek to predict or explain social phenomena or to address any specific philosophical issues of concern (Latour, 2005). Instead, it allows us to evaluate the actors within a network to better *describe* how they are influencing one another, which may help us establish new approaches with which to teach what it means *to nurse* within a temporally, culturally and technologically situated context. This is of relevance in the context of a nursing profession that is currently the focus of rapid technological innovation including the advent of sophisticated artificial intelligence (AI) and with artificial general intelligence (AGI) on the horizon.

It could be considered that viewing nursing as a social assemblage also addresses the tautology in Fawcett's nursing metaparadigm by recognising nursing as a dynamic, context-dependent practice shaped by interactions, relationships and actor networks. This perspective moves beyond a simplistic definition of nursing and highlights its adaptability and complexity within the broader healthcare system. It breaks the circularity of defining nursing by nursing (as a metaparadigm concept) itself within the metaparadigm, providing a more nuanced understanding of its role in patient care.

6 | INCORPORATING TECHNOLOGICAL ACTORS INTO NURSING PRACTICE

The advent of digital technologies in healthcare represents a significant shift in the nursing landscape. electronic health records (EHRs), for example, have transformed documentation practices, patient data management and information accessibility, fundamentally altering how nurses interact with patient information and collaborate with other healthcare professionals. There is also now an increasing body of evidence indicating the potential value of nursing robots, including for social functions (Wong et al., 2023). Nurses have been reported to recognise the benefits of these technologies for alleviating loneliness and helping with daily activities for dependent adults (Kang et al., 2023). Notably, care-dependent individuals have also been shown empirically to be less averse to robot carers than those not needing care (Shonmann et al., 2023). This indicates that technology's influence extends to the very core of nursing—the nurse–patient relationship. The use of telehealth and robot technology has redefined this relationship, allowing nurses to provide care and consultation remotely. While this expands the reach and efficiency of nursing care, it also introduces new challenges in building rapport and understanding patient needs without traditional face-to-face interactions. As technology continues to evolve rapidly, its impact on nursing is not static. New developments in healthcare technology continually reshape nursing responsibilities and practices. Nurses today must be adept not only in clinical skills but also in navigating these technological landscapes. This requires ongoing education and training in digital literacy, ensuring that nurses can effectively utilise technological tools and adapt to their evolving roles within the network. In a recent synthesis of 'digital' nursing theories, three broad concepts emerged as central in the context of nursing in the digital age: the competence of nurses' use of technology, the focus on technology in nursing to 'know' patients and the agency exerted by complex digital technologies (Wynn, Garwood-Cross, Vasilica, & Davis, 2023). This study also described the value of ANT in helping explore these concepts further within the context of nursing practice.

Technological advancements in nursing also reflect broader societal and healthcare needs. For instance, the growing emphasis on personalised medicine and patient-centred care has spurred the development of technologies that support these approaches, such as wearable health monitors and patient engagement platforms. This mutual shaping between technological development and healthcare priorities underscores the interconnected nature of the nursing network.

7 | ADAPTING NURSING EDUCATION AND PRACTICE IN THE DIGITAL AGE

The application of ANT to the nursing profession in the digital age may require a re-evaluation of how nursing is conceptualised, taught and practised. This transformative perspective challenges traditional paradigms and underscores the need for an adaptive approach in nursing that aligns with the interconnected and technologically advanced nature of modern healthcare. Traditional nursing curricula are often centred around individual skill sets and the much-critiqued competency-based approach (Collier-Sewell et al., 2023). However, nursing must evolve to encompass a broader understanding of the multifaceted networks in healthcare. This expansion involves integrating digital literacy into the core of nursing education, enabling nurses to proficiently engage with evolving technologies and understand their impact on healthcare delivery. Furthermore, nursing education must equip practitioners with the skills to navigate and adapt to the intricate web of relationships that include not only

patient care but also interactions with technology, healthcare policies and socioeconomic factors to help support individuals to obtain and maintain health. This approach requires a continuous learning mindset and adaptability to the fluid nature of healthcare practices and a departure from the notion of nursing theory as a static or accurate reflection of nursing practice in the long term, but useful instead to help guide practice when situated and considered within a broader understanding of the 'nursing network' as a whole.

8 | THE LIMITATIONS OF ANT

While ANT offers a robust framework for understanding the complex interplay of human and nonhuman actors in nursing, it is not without its limitations in this context. One of the primary critiques of ANT is its tendency to flatten the hierarchy of actors, treating all elements within the network with equal significance. While this offers a democratic view of all actors involved, it can sometimes obscure the nuances of power dynamics and the critical role of human agency in nursing practice. The unique skills, empathy and decision-making capabilities of nurses, for instance, might be under-emphasised when placed on the same plane as nonhuman actors like medical equipment or institutional policies. In response to this critique, ANT theorists argue that *considering* all actors within a network equally does not require any additional attribution of intentionality and that the 'agency' exerted between humans and nonhuman actants is not conscious but merely an observable consequence of their interactions.

Another potential limitation of ANT is that it could lead to an oversimplification of the complex ethical and intangible dimensions inherent in nursing. If applied in a heavy-handed way, the theory's emphasis on the symmetry of actors might not adequately capture the ethical considerations and moral responsibilities that are central to nursing care. The human impact of nursing, including the emotional, psychological and ethical implications of care, may be inadequately represented in a framework that primarily views the profession through the lens of actor-networks and interactions. This is primarily due to the emphasis of ANT theorists on what can be observed with a strong aversion to attributing social events to nonobservable phenomena (Latour, 2005). This focus on the observable could lead to a significant underappreciation of the less tangible, yet vitally important, aspects of nursing. The emotional labour involved in nursing, for instance, which includes empathy, compassion and the ability to connect with patients on a deeply personal level, is not as easily quantifiable or observable in the same way as overt interactions between actors in a network. Similarly, the ethical decision-making process in nursing, which often involves navigating complex moral landscapes and making choices that profoundly affect human lives, may not be fully captured by ANT's framework if scholars take too broad an overview of the actants in the nursing assemblage. These elements, though less visible, are integral to the practice of nursing and are essential in understanding the full scope of what it means to be a nurse. For this reason, researchers using ANT need to ensure that they look beyond the surface level of how actors interact, but instead zoom in to explore the observable evidence of the nuanced relationships between actors, and what they reveal about these seemingly intangible concepts that always leave traces.

Another way of ensuring that this nuance is not missed is by integrating ANT with traditional nursing theories to provide a more balanced and holistic understanding of nursing. An example of this using Orem's (1986) self-care theory can be seen in Vignette 3 below. Orem's theory focuses on personal autonomy in relation to the maintenance of health and well-being. It highlights that when an individual is unable to perform necessary self-care activities, due to illness, injury or a lack of knowledge, a self-care deficit arises. In such situations, nursing intervenes to support and assist the individual. The theory underscores the importance of patient autonomy, emphasising the nurse's role in assessing self-care deficits and providing the necessary care and education to empower patients in managing their health.

Vignette 3. Applying ANT to Orem's self-care deficit theory

> **Background:** Emma, a 65-year-old patient with type 2 diabetes, recently discharged from the hospital, is determined to manage her condition independently. Her case provides an excellent example of integrating ANT with Orem's Self-Care Deficit Nursing Theory to enhance understanding and support of her self-care regimen.
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> **Self-care agency and network:** Emma's journey begins with her strong desire to take charge of her health. In line with Orem's theory, she is initially assessed for her self-care agency —her ability to perform self-care activities. However, applying ANT, we also consider the network of actors influencing her self-care. This includes her social support, glucose monitoring device, her medication, the layout of her home and digital tools like her diabetes management app.
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> **Interactions in the network**: Emma's daily routine involves interacting with various elements in her network. Her glucose monitor, a nonhuman actor, plays a crucial role in informing her dietary choices and medication timings. The educational materials provided by her nurse help her understand her condition better, representing another key actor in her network. Her family, particularly her daughter, who checks in via video calls, forms the human support in her self-care network.
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> **Nursing system and technology**: As part of the partly compensatory system of Orem's theory, the nurse's role involves regular telehealth check-ins with Emma. These virtual interactions are crucial nonhuman actors in the network, enabling the nurse to provide support and education without being physically present. This set-up empowers Emma to manage her condition while knowing that professional help is just a call away. Likewise, if Emma's Wi-Fi connection, computer or glucose monitor were to experience a fault, these

would become barriers to Emma's self-management, just in the way that experiencing issues with the bus service to the hospital due to ongoing roadworks could impact Emma's ability to proactively engage with her healthcare team.

Policy and systemic influences: ANT also prompts us to consider broader influences on Emma's self-care practices. For instance, her health insurance policy affects her access to certain medications and monitoring devices. Local healthcare policies regarding telehealth services influence the frequency and nature of her interactions with her healthcare providers. For example, if her local trust does not provide nurses with up-to-date devices and IT support, Emma's nurses may miss telehealth appointments due to issues with slow or buggy software, or they may avoid offering telehealth services at all as they avoid interactions with equipment they feel causes more issues than benefits.

Outcome: By viewing Emma's self-care practices through the lens of ANT integrated with Orem's theory, we gain a comprehensive understanding of her situation. It is not just her actions that matter, but how she interacts with various elements in her network – from her glucose monitor to her nurse's telehealth sessions. This approach leads to a more nuanced understanding of her needs and the potential adjustments required in her care plan to enhance her self-care agency.

Other issues include ANT's methodological approach, which focuses on detailed case studies and the tracing of actor-networks, can be resource-intensive and may not always be practical for capturing the broader systemic and institutional factors that influence nursing practice. This approach might limit the ability to generalise findings and apply them to the wider nursing context, potentially overlooking broader trends and systemic issues in the healthcare system. However, it could be argued that, if we accept the philosophy of ANT theorists, networks are inherently changeable, and we accept that nursing is indeed best viewed as a social assemblage rather than a profession founded on clear theoretical and epistemological basis. It follows naturally that understanding nursing would require continuous describing of networks and an acceptance that the network would naturally never be 'complete' in its description. For example, using ANT to map the nursing landscape of nurse and technological actor interactions today is likely to create a vastly different picture to what may be observed in 20–30 years' time, if technologies such as, for example, nursing robotics and artificial intelligence were to be exerting greater agency within the network. Therefore, the challenge of accurately identifying which actants are most relevant within the network will require close consideration by researchers looking to utilise ANT.

In summary, while ANT provides valuable insights into the relational dynamics of nursing practice, its limitations in addressing the nuances of power, enduring professional norms, ethical considerations and broader systemic factors must be acknowledged. These limitations highlight the need for a nuanced approach that combines ANT with other theoretical perspectives to fully capture the complexity of nursing as a profession.

9 | CONCLUSION

In conclusion, this exploration of nursing through the lens of ANT offers an original and comprehensive perspective on the profession, particularly relevant in the rapidly evolving landscape of modern healthcare. By viewing nursing not just as a profession with a distinct body of knowledge but as a dynamic network of human and nonhuman actors, ANT provides a framework that captures the multifaceted nature of nursing practice. This approach acknowledges the significant role of technology, policy and societal factors in shaping nursing, moving beyond the traditional, human-centric focus of existing nursing theories. The application of ANT to nursing highlights the profession's adaptability and responsiveness to the changing healthcare environment. It underscores the importance of integrating digital literacy and an understanding of complex healthcare systems into nursing education and practice. This perspective is crucial for preparing nurses to navigate and thrive in a healthcare landscape marked by technological innovation and shifting patient demographics.

The integration of ANT into the discourse on nursing provides a valuable tool for rethinking and reshaping the profession in the face of contemporary challenges. It encourages a broader view of what constitutes nursing practice, considering the impact of various actors within a complex healthcare network. This approach does not diminish the importance of traditional nursing values and practices but rather situates them within a broader, more inclusive framework that reflects the realities of modern healthcare. By embracing both traditional nursing theories and the insights offered by ANT, the nursing profession may better adapt, evolve and continue to provide essential care in an increasingly interconnected and digital world. Therefore, the authors encourage nursing scholars to consider the application of ANT principles into their ongoing research, to further build the understanding of the dynamic and evolving nature of nursing.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no data sets were generated or analysed during the current study.

ORCID

Matthew Wynn http://orcid.org/0000-0001-9021-4747

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