

Cocreating Caring With Technological Competency as Caring in Nursing in the Anthropocene Era

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Abstract: Technology is integral to nursing practice. Nurse reliance on technologies can compromise human caring practices, providing the impetus to explore human caring cocreation between nurses and persons nursed in a technologically dense world. With technology as its central character, human dominance characterizes the Anthropocene era. Through the lens of technological competency as caring in nursing theory, the practice of nursing channels the fullness of human caring in harmony with technology. The harmonious coexistence of technologies, caring, and nursing emphasizes technological competency as caring, exemplifying the value of human caring interactions in a technologically dense nursing practice in the Anthropocene era.

Keywords: nursing; technological; theory; Locsin; competence

Introduction

Today's nurse functions with more technology than at any other time. With human ingenuity, connectivity, and technological innovation leading to population growth, new knowledge, and mass production of goods and services, greater life expectancy improved the overall health, resulting in a better quality of life (Green et al., 2014). The current universal dominance of human beings characterizes the era of the Anthropocene (Harari, 2017), defined as the current geologic age (Crutzen & Stoermer, 2000), with the primary characteristic markings of human activities creating a significant environmental impact (Steffen et al., 2015). This time of human dominance changed the ways of interacting with the environment such as exponential growth in telecommunication, networking, and connectivity (Steffen et al., 2015; TEDx Talks, 2010). The growth in technologies may affect human connections, such as through smartphone use, where humans can both instantly connect and disconnect.

However, in the Anthropocene era, there is a lack of discussion in nursing regarding the influences of advancing communication and health care technologies on human connections and caring nursing interactions between nurses and persons nursed. Treatises on technology, caring, and nursing aid in exploring new ways of cocreating caring through interactive nursing practice. Communication patterns and processes of nursing are critical to a caring practice. Thus, their prominence in the nursing discipline, together with an environment characterized by a technological acceleration in the human enterprise (Steffen et al., 2015; TEDx Talks, 2010), ably conjures up images of how nurses and the nursed communicate caring in their nursing practice. Exploring the cocreation of human caring practice with influential concepts from the theory of technological competency as caring in nursing (TCCN) will add knowledge that augments nursing axiology. Using this framework for practice may help cocreate caring in nursing in technologically dense health care environments.

Theoretical Viewpoints

Nursing and technology are inseparable. Nursing practice has coexisted with technologies to a great extent, with technology understood as "a means to an end" (Heidegger & Lovitt, 1977, p. 4). However, with technological developments

now advancing exponentially (Berman & Dorrier, 2016) and becoming more complex (Gough et al., 2014), technology as simply "a means to an end" may not be all that makes it relevant. This relevance is because one may also view technology as a "way of revealing" (Heidegger & Lovitt, 1977, p. 12). Technology seems to be inseparable from humans, particularly in the Anthropocene era, acknowledging the possibility that humans may, in fact, become technologies (Ramos, 2017) as a means of achieving and revealing human dominance.

Despite technological advancements, benefits of human caring in nursing are less observable. For instance, Gough et al. (2014) stated that new technologies in health care settings resulted in increased nurses' patient workload, reducing nurses' direct patient-caring time in practice. Technology that did reduce the nurses' workload freed more time for nurses to do other direct patient-related care, yet the nurses' attention often shifted toward the technology rather than being with patients (Gough et al., 2014).

A theoretical framework grounded in caring is necessary to facilitate caring cocreation in nursing practice and avoid creating barriers occurring with the use of technology. Theory incorporation in nursing is grounded in caring science such as the TCCN supports Welch's (2020) claims that nursing's ontology is caring, and aesthetic knowing is the epistemology of nursing practice. Caring as the ontology of nursing (Welch, 2020) acknowledges the honoring of personhood between the nurse and the person being nursed to live meaningful lives as they grow and live in caring from moment to moment (Boykin & Schoenhofer, 2001). Also, aesthetic knowing as the epistemology of nursing practice (Welch, 2020) ensures that nurses remain technologically competent in engendering new meanings of caring cocreations as they are engaged with advancing health care and communication technologies in the Anthropocene era. From this perspective, the theory of TCCN provides an appropriate caring framework for nursing in the Anthropocene era.

The Theory of TCCN Explained

As a middle-range nursing theory, the theory of TCCN (Locsin, 2005) supports human caring-nursing interactions in the human-dominated Anthropocene era and highlights nurses' intentions to use technologies competently in

cocreating technology and caring in nursing practice (Locsin, 2005). The tenets of the theory of TCCN acknowledge persons as caring who remain continually whole from moment to moment, thus facilitating caring interactions in nursing. Knowing persons as caring means knowing persons more fully through the intentional and competent use of technologies in nursing practice (Locsin, 2005).

Caring involves a relationship (Boykin & Schoenhofer, 2001). For instance, nurses can cocreate caring virtually by competently using telehealth technology to establish a relationship with their patients. Both the nurse and the patient can intentionally and mutually be engaging in knowing each other more fully as caring persons during a telehealth session. As Roach (2002) explained, "Competence without caring can be brutal and inhumane" (p. 54); full competency with technologies in nursing means intentionally knowing persons more fully as caring; nurses also competently use technologies to understand patients fully as participants in their care rather than as objects of care (Locsin & Purnell, 2015). By supporting and ensuring technological competency as an expression of caring in nursing, persons can live their lives more meaningfully, particularly in the Anthropocene era. Locsin (2005) posited that the harmonious coexistence of technologies and caring in nursing is essential in cocreating caring moments between the nurse and the nursed in a nursing encounter. In the Anthropocene era lies the coexistence of persons, technology, and nursing.

Discussion

Human dominance and the dependency on technology marked significant environmental changes explicated in the *Fourth Industrial Revolution* (Schwab, 2018), with humans adapting to and coexisting with technology. Interestingly, as Savina Schoenhofer (personal communication, March 23, 2022) explained, human beings and technology may already seem inseparable in the Anthropocene era; however, as technology becomes more complex and pervasive, human beings and technology become even more inseparable. Technology becomes a part of human existence, prompting coexistence and reliance, including in health care settings.

In the health care setting, multiple technologies are available to nurses. Increasing reliance on technology by nurses may compromise the

value of nursing processes typically centered on human caring. In the Anthropocene era, the increased use of health care robots and telehealth demonstrate nursing's increasing reliance on technology (Clipper, 2020). The COVID-19 pandemic made the reliance on technology even more apparent in health systems and care delivery such that using advanced technologies may now become the epitome of what is to be the new normal of health care. The pandemic revealed more technologically advanced nursing practice circumstances, creating a drive toward technology dependence. For example, increased use of technology and artificial intelligence in health care settings mitigated the spread of COVID-19 (Clipper, 2020), such as with telehealth. This increase in telehealth usage replaced in-person nursing with an alternative virtual equivalent. Caring is necessary to prevent dehumanization.

Perceiving the Dehumanizing Influences of Being Dependent on Technologies

Some may perceive that over-reliance on technology engenders a dehumanizing experience; too much reliance on technology compromises the value of personhood. Dehumanization may exist when nurses use technology to replace caring, perceiving the patient as an object rather than as a participant of their care (Locsin, 2005). As Barnard and Sandelowski (2001) pointed out, technology itself is not the main protagonist of the dehumanizing effects of technology on human experiences; instead, what may be at fault is technology use and perception. To prevent the perceived dehumanizing effects of technology dependency, nurses must use technology competently as a means to humanize the experience, using it to know the person more fully, allowing their patients to interact, live, and grow in caring. Therefore, nurses should not merely be treating their patients as objects of care but rather as participants engaged in their care (Locsin, 2005).

New Opportunities for Caring Amid Advancing Technologies

It seems likely that nursing and advanced technology will continue to coexist, providing benefits and opportunities for nurses to cocreate caring in new ways. For instance, in China, unmanned robotic cars deliver food and medical items to patients and health care

workers in the hospital during the COVID-19 pandemic without compromising safety (Arthur & Shuhui, 2020). People in Denmark found it favorable to use a robot bathtub because of its usefulness and practicality (Beedholm et al., 2015). In the United States, Clipper (2020) described the increased use of telehealth during the COVID-19 pandemic. These examples provide nurses with new opportunities to engender human caring cocreation with the competent use of advancing technologies. Despite the benefits of advancing technologies in health care and the new opportunities for nurses to express caring, nurses must be cautious when using technology to avoid disharmony in caring.

Disharmony in Caring

Nurses may experience disharmony when practicing amid technology. Disharmony occurs when using technology to replace caring and failing to consider that patients are also mutually engaged persons (Locsin, 2005). Competence is an attribute of caring (Roach, 2002); nurses must understand that the purpose of the TCCN theory is for nurses to know themselves and others as caring persons (Locsin, 2005), through which caring includes technological competence. Disharmony in caring occurred during the COVID-19 pandemic when nurses used extension tubing to place intravenous pumps in the hallways outside patient rooms (Shah et al., 2020). Although this practice reduced the risk of viral exposure, the risk of disharmony between nursing and technology arose as nurses perhaps cared for and connected with the pumps rather than their patients.

Nurses can reduce disharmony through caring connections. One way to facilitate this is through storytelling by sharing experiences with colleagues regarding COVID-19 hospitalization experiences amid advancing technologies. According to Schoenhofer and Boykin (2022), storytelling reaffirms the nurse's commitment to caring in nursing. Through sharing stories, nurses will be able to understand how caring in nursing in the new normal can transpire through meaningful interactions, providing opportunities for nurses to conceptualize and communicate creative ways of cocreating caring in technologically advanced nursing care situations. Another way to creatively reduce disharmony is by acknowledging technology-human dualism.

Technology-Human Dualism

Technology-human dualism exists and may result in disharmony. The Anthropocene era advances human-technology caring coexistence with technology considered integral to expressions of human wholeness. Humans' reliance on technology underscores their coexistent nature. The reliance on technology by humans is seemingly inseparable in the Anthropocene era and likely more so in the future. History shows that advances in medicine allow for organ transplantations between humans; in the future, we could expect some expansion of this trend in replacing human parts with human or mechanical parts. For example, there are artificial pacemakers that connect to a smart device with a surveillance app (Tarakji et al., 2021) and an implanted glucose-measuring system with outstanding accuracy (Garg et al., 2022). In these situations, nurses need to be competent in their practice of nursing, framed within the theory of TCCN. The TCCN theory allows for exploring caring cocreation for a seamless connection between humans and technology (Locsin & Purnell, 2015) and the perceived inseparability of humans and technology in the Anthropocene era. The TCCN theory (Locsin, 2005) continues to remain relevant in facilitating caring nursing interactions by engaging with others and knowing persons as caring.

Technologically Advanced Nursing Care Situations

One technologically advanced nursing care situation is telehealth. Clipper (2020) found increased use of telehealth during the COVID-19 pandemic. Telehealth may raise a concern about inauthentic caring, thereby compromising the value of caring in nursing practice. For instance, virtual nursing may challenge the notion of authentic presence. *Authentic presence* is the intention of the nurse to be there with the patient in the moment (Boykin & Schoenhofer, 2001). However, while the lack of physical proximity to patients might limit certain expressions, proximity may not necessarily be a prerequisite for authentic presence and caring; instead, these virtual interactions could enable other creative, caring expressions.

The theory of TCCN addresses this issue of inauthentic caring brought about by technologically advanced nursing circumstances. With

the theory of TCCN's focus on personhood and nursing caring interactions (Locsin, 2005), nurses can cocreate caring in nursing through the intentional and competent use of communication technologies such as telehealth nursing encounters. During a telehealth situation, nurses can competently use the technology to be with their patients virtually with the intention of knowing them as caring persons. Guided by TCCN as a framework (Locsin, 2005), telehealth nurses can get to know their patients as caring persons virtually by using telehealth technology competently and by considering their patients as participants rather than objects of care during a telehealth experience. It is in the nurse's competent use of telehealth technology to intentionally know their patients and through mutual participation that telehealth nurses can come to know about their patients more fully as caring persons in a telehealth session. As long as caring is lived in the moment between the nurse and the one nursed in a telehealth situation, the dimensionality of distance, time, and settings may become irrelevant in caring cocreation.

Implications for Nursing

The harmonious relationship between technology and nursing in the Anthropocene era has far-reaching implications for nursing. Nursing education continues to rely on an empirical and behavioristic model (Bevis, 2007), reflecting the outdated view that human beings need to be fixed and made whole again (Boykin & Schoenhofer, 2014). The traditional linear nursing process grounded in the biomedical model continues to guide nursing practice. Technology dependency in the Anthropocene era and nursing's positivistic, empirical, biomedical, and behavioristic philosophical views may limit the influence of caring in nursing, reducing nursing education and practice to an apprenticeship for training in instrumental skillfulness.

Caring and technological competency guided by a holistic model should have a substantive focus in nursing education to meet the demands of a technological future. Nurse educators can also teach their students to enhance cocreating caring through multiple ways of knowing in nursing (Carper, 1978). The concept of caring as the ontology of nursing with aesthetic knowing as its epistemology (Welch, 2020) highlights the importance of meaning making through

significant interactions to further the understanding of caring in technologically advanced nursing practice, enhancing the axiology of future nursing practice.

Nursing education curricula should include frameworks for technological and caring competencies. Furthermore, curricular models must be expansive, holistic, relevant, interactive, and supportive of contemporary nursing practice's evolving caring ontological and epistemological perspectives. Theoretical nursing models such as the TCCN framework are a necessary addition to the nursing curriculum. Nursing thought, choice, and action can only be grounded in nursing knowledge if it is to reflect the purpose and values of the discipline of nursing. Given the growing reliance of nurses on technology, the current and future nursing workforce should be prepared to meet the demands of a technologically informed future nursing practice.

There may also be a need for further study of the human–technology caring interactions and the mechanism of cocreating caring between these interactions. As nursing and technology coexist, nurses must be aware of the changing perceptions of the human–technology dichotomy. There is a need to explore the interactions between humans and technology and its caring cocreations, including issues that may arise from human–technology interphase and the impact of human–technology interactive processes on the value of human caring today and in future nursing practices.

The changing landscape of nursing with nurses' reliance on technology is an indication of the invaluable yet concerning view of human caring practices. With the theory of TCCN framing nursing practice as knowing persons as caring, a vision arises that the value of human caring interactions in practice between the nurse and the nursed can further generate new meanings of caring with nurses, the persons nursed, and technology continuing their harmonious coexistence in the Anthropocene era. Even today, during the COVID-19 pandemic, nurses' interactions with persons whom they nurse using technologies as means of communication and delivery of care have changed and are being valued immeasurably. These communication processes between the nurse and the one nursed in a virtual caring situation need further exploration.

Conclusions

The Anthropocene era offers a glimpse of what the posthumanistic future may hold. As reliance on technology increases, views about human–technology dichotomy are changing, acknowledging the possibility of resolving this dichotomy and supporting coexistence. As COVID-19 highlights the coexistence of nursing, caring, and technology in the Anthropocene era, concerns arise. These concerns include the perceived dehumanizing effects of dependency on technology, the presence of technologically advanced nursing care situations, the changes in human–technology dichotomy perception, and the caring challenges brought about by human–technology caring interphases. These are more likely to occur in the future with the potential to compromise the value of human caring interactions in nursing. The way nurses express caring through the competent use of technology in nursing practice may change with advancing technology. Human beings may continue to evolve as technological beings, introducing multiple ways of communicating nursing as caring amid complex technologies.

Using the theory of TCCN as a framework for dealing with advancing technologies influencing nursing practice may offer ways of guaranteeing well thought-out actions that nurses can take, particularly in decisions involving the competent use of technologies as an expression of caring in nursing. Ensuring that the coexistence of human beings with technologies in the era of the Anthropocene continues to cocreate human caring practices in nursing, human coexistence with advancing technologies may change considerably with human caring expressions in nursing, offering new ways of nursing. Given the technological advancements within the era, explaining the evolution of nursing care practices with advancing technologies can be facilitated in the light of the TCCN as caring in nursing.

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