

# Advancing the Theory of Technological Competency as Caring within Nursing and the Health Sciences : From Philosophical and Theoretical to Praxis

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## Editorial

The contents of this special issue in *The Journal of Medical Investigation* are theoretical, conceptual, philosophical and application papers regarding developments in the middle-range theory of Technological Competency as Caring in Nursing (TCCN) (1, 2). However, the theoretical and practical developments in the Health Sciences have not been clearly distinguished as influential to the science of Nursing. This special issue revels at the collaborative engagements within Nursing and the Health Sciences in advancing the theoretical, and practical applications. Moreover, knowledge development in the Health Sciences through disciplinary formalized research, engage scholars, practitioners, and scientists towards advancing the ontology and epistemology of the theory within the Health Sciences.

One of the main paths to advancing theory is revisiting and re-envisioning its conceptualizations and assumptions, especially through interdisciplinary collaboration. The dawn of the Technocene or the Anthropocene (3, 4) has magnified the categorical role of the Fourth Industrial Revolution (5) in which human beings have become the dominant characters in the global scientific and industrial revolution, redirecting and restructuring the sciences facilitated by the emergence of a highly sophisticated technological world (6). Elucidated in the admiration of Artificial Intelligence is the offering of machines the challenge to human lives and livelihoods (7, 8). Obviously, what was considered high-tech in the final quarter of the 20th century is no longer astonishing in the 21st century.

The papers in this special issue reflect thoughtful understandings about advancing the theory of TCCN, and the influences of the health sciences as interdisciplinary partners in human care in the next century and beyond. The first three papers situate the content of the special issue by introducing the philosophical and practical discourses in expanding the awareness of theory-based practice within a highly technological world of human care. Zhao, Osaka, Yasuhara, King, and Tanioka offer a reflective journey of Caring through a case study, while Tanioka emphasizes the role of humanoid robots in rehabilitation, while Hernandez enhances the enchantment of internet-based technologies as a practical application of self-care in chronic illness. Within the Health Sciences, Haga and Otsuka delivered possibilities regarding radiological imaging as opportunities for visualizing anatomical and physiological aspects of human structures in order to know persons in their wholeness. Standardization of imaging underpinned by machine learning is critical to the unpredictable nature of being human.

The process of knowing persons as whole (1, 9) is critical to appreciating humanness of persons. In nursing, the process of educating future practitioners in order to know persons as participants in their care is heightened by Bonito's article on virtual clinical environments.

Whereas the development of the theory can also be made more meaningful through measuring its hypothesized effects, Miyamoto, Ito, Miyagawa, Yasuhara, Tanioka and Locsin have designed the Perceived Inventory of Technological Competency as Caring in Nursing (PITCCN) and determined the psychometric properties pursuing a way to predict value-laden and theory-based practice. Tanioka, however, described the Transactive Relationship Theory of Nursing (TRETON) (10) declaring the practice process of nursing engagements with humans and intelligent machine relationships.

Characteristic phenomena among older adults regarding their

transactive relationships were addressed by Tanioka, R., Sugimoto, Yasuhara, Ito, Osaka, Zhao, Kai, Locsin, and Tanioka, T. This relationship was extended by the investigation of Ujike, Yasuhara, Osaka, Sato, Catangui, Edo, Takigawa, Mifune, Tanioka, and Mifune, K. about encounters of Pepper-CPGE, a humanoid robot, as an innovative intervention for older persons. These papers were products of a two-day conference and Seminar-Workshop. Yasuhara, et al. summarized the program of activities, describing the opportunities to learn and engage in collaboration with colleagues in Nursing and the Health Sciences.

Finally, we are grateful for the opportunity for co-editing this issue of *The Journal of Medical Investigation*. It is our hope that these papers will continue to inspire scholars, scientists, and researchers of Nursing and the Health Sciences to further research and scholarly works that advance the theory of TCCN. Theory-based practice require adherence to the tenets of the theory and these papers delivered the intent towards linking theory, research, and practice. It is our ardent hope that the Institute for Advancing the Theory of Technological Competency as Caring in Nursing will incite more opportunities to grow the philosophical and practical values of theory-based practice.

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