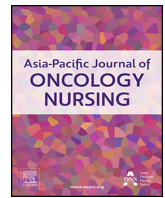


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# Asia-Pacific Journal of Oncology Nursing

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## Editorial

### The art of nursing in the fourth industrial revolution: Lessons learned



The fourth industrial revolution was revealed at the World Economic Forum in 2016,<sup>1</sup> which was then coined as Industry 4.0 in Germany where companies and institutions started adopting technologies to increase productivity and quality.<sup>2</sup> It became an era enabled by more advanced technologies following those used in the first, second, and third industrial revolutions.<sup>1</sup> Emerging technologies such as robotics, artificial intelligence, nanotechnology, the internet, and 3D printing are examples of these technologies that promote easier and faster methods of communication and connectivity among users.<sup>1</sup> The expected impact of technology adoption on employment has shown that “organisations estimated that machines perform 34% of business-related tasks while humans perform the remaining 66%”.<sup>3</sup> However, studies from the Future of Jobs Report found that analytical and creative thinking remain the most important skills for workers, and among the 10 top core skills needed by employers from their workers besides technological skills are having empathy and active listening when working with others are important.<sup>3</sup>

The use of digital technologies is increasingly being used by nurses at their workplace. Electronic medical records, telehealth, social media, virtual and augmented reality, clinical decision support systems, and robots are used worldwide in health services. Many examples show how digital technologies have benefited nursing practice and education.<sup>4</sup> For instance, telehealth programs enable nurses to conduct daily monitoring, coaching, and triaging of patients.<sup>5</sup> Mobile devices, such as the use of smartphones are used by nurses to provide health education on pain management to adolescent patients with cancer.<sup>6</sup> Another example was the use of WeChat to provide peri-operative instruction to parents of children undergoing day surgery in China.<sup>7</sup> A study also demonstrated the benefit of m-Health apps for supporting self-management of patients with heart failure in Canada.<sup>8</sup> Furthermore, integrating artificial intelligence (AI) technology in breast, lung, prostate, and colorectal cancer radiology has also been used in improving the care pathways for cancer patients.<sup>9</sup>

Health professional education has incorporated new technologies to prepare practice-ready nurses who will work with advancing technologies in clinical settings.<sup>10</sup> The integration of machine learning and artificial intelligence significantly altered how students learn.<sup>11</sup> Online supplemental aspects of nursing education are used to deliver some contents of the program and provide remote learning opportunities for students.<sup>12</sup> The use of artificial intelligence and virtual simulation has provided effective interprofessional education for nursing students in Singapore.<sup>13</sup> Courses in informatics and digital health subjects are now part of the undergraduate and postgraduate nursing programs and it as urged nurses to work with and learn from computing, engineers, and other interdisciplinary colleagues to inform the creation of nursing knowledge to support practice.<sup>12</sup> All these emerging advanced technologies in nursing education and practice have

shown benefits to assist nurses with their work but can nurses continue to adopt these technologies without losing the art of nursing in this fourth industrial revolution era or the upcoming fifth industrial revolution?

We all accept that nursing is a combination of science and art. Science is important as it provides empirical knowledge for evidence-based nursing practice. But the art of nursing has been evident from the time of Florence Nightingale when she described that providing comprehensive care to patients’ needs is a form of art.<sup>14</sup> Robert and Henderson<sup>15</sup> also report that the unique function of the nurse in assisting the individual, sick or well is an art. The International Council of Nurses<sup>16</sup> also emphasized the art of interpersonal interaction and communication in building and maintaining the relationship between a patient and nurse. Several components of the art of nursing have been described in the literature such as empathy, intuition, and compassion.<sup>10,17</sup> Although research shows the effectiveness of the use of technology in patient care, nurses need to embrace these emerging technologies and be prepared to integrate them into patient care and ensure that human care is still at the center of the nursing profession (Buchanan et al., 2020).<sup>5</sup> Pandian et al.<sup>10</sup> emphasized that the value of soft skills should not be overlooked as the interpersonal skills of nurses and compassionate care will have much more applications to patient care compared to any artificial intelligence that lacks human connections and emotions. Nurses are the largest group of health professionals as administrators, educators, practitioners, researchers, and policymakers. Scientific knowledge in preparing these nurses for these roles is needed to provide evidence of the clinical performance of the art of nursing care.<sup>14</sup>

The delivery of person- and family-centered compassionate care is a core and valued component of nursing as they engage with patients to promote their well-being.<sup>5</sup> In a scoping review of Malenfant, et al.<sup>17</sup> patients described compassion as “kindness, authenticity, attentiveness, forming a relational connection, displaying presence and warmth, acceptance, understanding, listening, helping, communicating effectively, being involved, and being gentle and caring”. Nowadays, technological advancements in the make-up of companion robots with artificial intelligence used in healthcare have evolved to help in caregiving, especially for the elderly and people with disabilities.<sup>18</sup> Healthcare robots are now being programmed by humans to act human-like to simulate the human nurse to attend to patients’ holistic care needs. Are we then endangering our caring profession that encompasses empathy and connections with our patients by being replaced by the advancement of robots with AI technologies? What is needed to maintain the art of nursing in the 4<sup>th</sup> industrial revolution are to: (1) consider leveraging the technology to prepare future-ready nurses to thrive in a highly technological healthcare setting without losing the essence of nursing;<sup>10</sup> (2) build strong nursing leadership to drive

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technological change and ensure the continued delivery of high-quality, person-centered compassionate nursing care;<sup>5,12</sup> (3) develop new digital health care model and policy to support the integration of technology into nursing practice;<sup>5,18</sup> and (4) involve in designing innovative technological interventions with engineers that is linked to the theory of human caring.<sup>5,10,18</sup> It is through these and the triadic partnership with the patients, nurses, and technology that we can maintain the art of nursing. So let us not forget that whatever we do, nursing is foremost an art supported by scientific evidence-based interventions.

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Not required.

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### Declaration of generative AI and AI-assisted technologies in the writing process

No AI tools/services were used during the preparation of this work.

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