

**EDITORIAL**

## VIEWPOINT: NURSES PREPARATION IN THE ERA OF THE FOURTH INDUSTRIAL REVOLUTION

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We are now experiencing an era of the fourth industrial revolution characterized by a fusion of disruptive technologies like cyber-physical systems, cloud technology, cognitive computing, robotic process, artificial intelligence, and the Internet of Things, which impact every health care industry in both developing and developed countries, from being manpower-intensive to being technology-centric. The example of health care delivery model driven by technology changes today can be seen from our customers who often use online consultations to healthcare professionals to get the treatment ([Milton, 2018](#)). In some countries, for example, Japan has been developing various types of humanoid nursing robots for delivering nursing care ([Tanioka et al., 2017](#)), which poses a challenge for nurses around the world, and changes how we work, live and play. In addition, this era is considered as a threat for unskilled workers or new graduates who are at a high risk of being left unemployed. Therefore, we need to be able to prepare ourselves to establish the impacts on nursing practice and patient outcomes. This editorial is to highlight some points for nurse preparation in the fourth industrial revolution.

### **Nurse's preparation for Industry 4.0**

#### *Disruptive innovation*

Disruption is not a new idea, which is also considered as the nature of capitalism with technology progress and evolution. Disruptive innovation means a process of translating an idea or invention that creates a new market by applying a different set

of values, which ultimately and unexpectedly overtakes an existing market ([Pitts, 2012](#)). This reflects that we may not be able to reject the reality by not following the technological expansion, as the yesterday's solution may not be applicable for health challenges today. Nurses need to be aware that technology is a main driver for disruptive innovation in nursing education and practice, which therefore they firstly need to understand what a digital life look like now, compared to what it looked like before. In nursing education, the change is seen from paper-based to online-based education, which includes the innovation of E-learning, long distance learning, mobile platforms, virtual learning, social media, video conferencing, and other methods. In nursing practice, the technology development may include telenursing, triple care by remotely connecting with clients via camera, digital and bluetooth stethoscope, chip monitor, and other methods. However, the premise of disruptive innovation is not about the technology itself, but it is about the application of technology (a new product) in a simple and convenient way, or creating a new environment for using the product that never exists ([Sensmeier, 2012](#)).

The concept of disruptive innovation is promising although the consequences will not be positive, but it may improve collaboration and establish nurse professional impact on care, as the main idea of disruptive innovation is to keep the patients at the center of the systems of care among health professionals

supported by smart technology, and to focus on individual patient's needs, rather than focusing on complex disorders and urgent health crises (Sensmeier, 2012). However, to support that disruptive innovation, nurses should have good attitudes and high skills in technology, which is considered as a challenge for those who are not familiar to with informatics system. Therefore, to attend the informatics system training and development is necessary to use or apply a new technology intelligently.

#### *Understanding nursing philosophy*

In response to the industry 4.0, nurses must be grounded in their discipline. Understanding philosophy in nursing is needed, which nurses step back from what they do to see what nursing is all about and to think critically about others' opinion on the matter (Kikuchi & Simmons, 1996). Nursing has *caring* as its core in a way practicing of loving-kindness and equanimity, authentic presence with deep belief of others, cultivation of individual's own spiritual practice toward wholeness of mind/body/spirit, being the caring healing environment and being open to unexpected life events (Watson, 2010). *Caring* is dependent on where we are (time, space, culture), one's level of development (e.g. training, experience, education), and the situation (e.g. disaster, high pressure or relaxed situation, etc.), including consideration of patient's (subjective) perspective and nurse (objective) perspective (Gunawan, 2016). Therefore, although we are surrounded by technology and robotics in this disruptive era, nurses with human caring with personal soft skills will not be replaced at all. Nurse educators should emphasize *caring* in any parts of the subjects in nursing curriculum, and nurse leaders should continually promote *caring*, *caring* relationship and *caring* moment in nursing practice.

To sum up, to accelerate pace of change in the today's era, nurses need to find innovative approaches to create a new product or a new environment, and bring together all different perspectives to integrate evidence into care delivery and

decision making to serve nursing and patients well, supported by an advanced technology and a strong foundation in nursing philosophy.

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Both authors equally contributed in this editorial.

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