

Fourth Industrial Revolution and Nursing Research

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I hope you all stay healthy and achieve what you plan for the Year of the Black Tiger.

Since the onset of the Coronavirus disease 19 (COVID-19) pandemic, one may say that the future is now more difficult to predict. In addition, through the emergence of a new science and technology revolution commonly known as the “fourth industrial revolution” and a new technology called “metaverse”, the standard of “ordinary normal” that people have recognized so far has changed. Instead, the term “new normal” is often used nowadays to reflect the recent technology revolution together with the effect of COVID-19 [1]. As the health sciences are no exception to this change, a “new normal” standard needs to be adopted in nursing research according to the current trends in the nursing field. Therefore, I share my thoughts regarding the potential direction that nursing research should focus on in the era of the fourth industrial revolution.

NURSING RESEARCH REFLECTING SOCIAL SITUATIONS

Nursing scholars have continuously conducted research to build a foundation of knowledge and to establish strategies to maintain and improve human health appropriate to the ongoing health and social trends. This is because nursing studies have the characteristics of practice-based development;

therefore, the social situation is one of the important factors to be considered for the studies [2]. These characteristics are also well illustrated in a journal produced by the Korean Society of Nursing Science, which, as part of the celebration of its 50th anniversary in 2020, analyzed the trends in the reports and papers over various periods [3]. In the 1970s, when the theme of population growth along with Korea’s economic growth was important, nursing research focused on birth control and family planning as the main topics. Since 2010, along with economic growth, the increase in the number of chronically ill patients and in the elderly population have shifted the focus of studies to the management of chronic diseases including caring for dementia patients and their families. Recently, in relation to COVID-19 occurrence in 2019, research is being conducted in connection with current social issues such as infection control [4], nurses’ experience [5], and education in non-face-to-face situations [6]. In conclusion, nursing research has developed over the past half century in response to societal needs to address practical issues. Nursing research should now focus on developing knowledge appropriate to the changing environment arising from the fourth industrial revolution.

FOURTH INDUSTRIAL REVOLUTION: RESEARCH DIRECTIONS

The fourth industrial revolution is a concept that was first

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mentioned at the World Economic Forum held in Davos, Switzerland, in January 2016. The revolution arises from the collection of data generated from all objects and humans (internet of things [IoT], mobile); from the accumulation and analyses of data through the cloud or big data; and from the use of smart technology through artificial intelligence (AI) [7]. In addition, low birth rate, increasing aging population, low economic growth, and major changes after COVID-19 in the era of the new normal are accelerating the application of these smart technologies across society. The field of health science is no exception; therefore, an increasing number of different sectors within the health industry are functioning using digital technologies such as AI and big data. The sectors within the health industry that adopt digital technologies are rapidly growing by converging basic science with information and communication technology (ICT) [8]. In addition, it is expected that the industrialization of ICT-based smart healthcare services will begin intensively thanks to the government's will to foster next-generation industries [9]. In line with this, the nursing sector also needs to conduct research and development with the aim of improving people's quality of life and working efficiency. Additionally, research related to nursing services in the medical service industry should be initiated along with reports on outcomes and modifications of customized care services, which are provided by collecting and analyzing various health-related data in the nursing field. Among the five tasks selected as key health-care promotion tasks based on the Fourth Industrial Revolution, the development of smart convergence medical devices can promote health service efficiency and work convenience through the development of smart nursing devices [10]. To vitalize such research, besides the knowledge of the health field, an understanding of various disciplines such as ICT and biotechnology is required; therefore, it is necessary to conduct convergent group research in connection with other academic fields, along with nursing research. In addition, for independent research in the nursing field, learning opportunities in related fields would need to be provided through education, and therefore, it is necessary to provide a convergence program that provides for master's courses that combine life science, medicine, and engineering [10].

FOURTH INDUSTRIAL REVOLUTION: HUMAN-CENTERED CARE

Most major areas of activities undertaken by nurses so far have been related to treatment, such as medication and related interventions. However, nursing services that require accurate skills linked to these treatment areas are expected to be replaced by robots and AI in the future [11]. Locsin and Ito [12] state that all medical devices to which smart technology is applied can perform nursing work more accurately and efficiently than humans. This situation will contribute to a significant reduction in the nurses' burden of work and to promoting patient safety while transferring major nursing activities to machines. If so, what should be the main activities of nursing in the future? We need to go back to the beginning and explore the nature of comprehensive nursing, that is, human-centered care. Even if a machine with empathy skills were to be developed, it would have limitations in providing empathy and full-fledged nursing compared to what humans can provide. Therefore, even if the fourth industrial revolution progresses and everything can be replaced by machines, nursing is classified as an occupational group that will not disappear within the next 100 years [13]. Nursing is said to be co-created by a relationship between a nurse and a patient in which bilateral care takes place [14]. Therefore, while participating in the fourth industrial revolution and activating research to develop nursing studies and expand the field of nursing, the main research topic of nursing should be "human-centered care"—the essence of nursing itself. Communication, sharing, understanding, and even quality of life for better human lives can be the main research thrust. The results of these studies will contribute to defining nurses' independent areas of activity and expertise in the new era. In addition, it is necessary to conduct research on human-centered smart care services that can realize the purpose of nursing services for holistic care in healthcare settings where various advanced science technologies, such as artificial intelligence, robot technology, and unmanned services, can be combined.

I hope that many future studies will direct the nature and

technology of nursing toward human-centered care.

CONFLICTS OF INTEREST

Lee YW has been the President of Korean Society of Nursing Science since 2022 but has no role in the review process. Except for that, no potential conflict of interest relevant to this article was reported.

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DATA SHARING STATEMENT

Please contact the corresponding author for data availability.

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