

REVIEW ARTICLE

Providing High-touch Through High-tech During Pandemic in the Intensive Care Unit: A Narrative Review

Debie Dahlia^{1,2}, Juliana G.E.P Massie², Erna Puspita Sari^{2,3}

¹ Department of Medical Surgical Nursing, Faculty of Nursing, Universitas Indonesia, Depok, West of Java 16424, Indonesia

² Department of Nursing, Universitas Indonesia Hospital, Depok, West of Java 16424, Indonesia

³ Post Graduate Nursing Program, Faculty of Nursing, Universitas Indonesia, Depok, West of Java 16424, Indonesia

ABSTRACT

Since the COVID-19 outbreak began, healthcare providers have had to adapt how they triage, diagnose, and care for patients. Intensive care nurses are challenged by a new working scenario inside the COVID-19 Intensive Care Unit (ICU). They must provide the expected high standard care with advanced technology for patients while maintaining the important role of nurse's therapeutic touch. This review discusses the touch and technology of nursing in general, which is correlated with providing nursing care in the Intensive Care Unit (ICU) during the pandemic. This study aimed to create theoretical foundations for nurses' role in dealing with technology in the ICU during the COVID-19 pandemic. As a result, nurses appreciate the advantages of technology, but they also recognize that human interaction is important. Nurses must be able to provide appropriate care through the use of high technology without forgetting the value of nursing itself which is manifested in the form of therapeutic touch.

Keywords: Intensive Care Units, nursing, technology, touch

Corresponding Author:

Juliana G.E.P. Massie, Sp.Kep.M.B

Email: juliana.gep71@ui.ac.id

Tel: +6282112323732

INTRODUCTION

In December 2019, a new type of β -coronavirus globally known as SARS-Cov-2 was found in Wuhan, China. It infects humans and has a series of clinical manifestations, such as septic shock, Acute Respiratory Distress Syndrome (ARDS), or severe pneumonia. In February 2020, World Health Organization (WHO) officially claimed Corona Virus Disease 2019 or COVID-19 as an international public health emergency(1). The virus's rapid spread had already led to an increase in 42,747 cases and 1,017 deaths in China, and cases have been reported in 114 countries (1, 2). As the COVID-19 pandemic accelerates, nearly 117,799,584 cases of COVID-19 infection have been reported worldwide, including 2,615,018 deaths (3). When patients are admitted to hospital, this percentage increases and the worldwide mortality rate is between 23.4% and 33% (4). In Indonesia, until the second week of March 2021, there were 1,398,578 confirmed cases of COVID-19 and about 37,932 deaths (3).

As COVID-19 cases rapidly increase, medical staff are exploring more effective and feasible management for such patients (5). The requirement for expanding COVID-19 Intensive Care Unit (ICU) bed capacity was

apparent from the start of pandemic. Critically ill patient with COVID-19 tend to require higher level of care than typical Intensive Care Unit (ICU) patients. They may require mechanical ventilation or other life-saving gear and require the consideration of different suppliers (6). Patients in Intensive Care Unit (ICU) are subject to high psychological and physical stress. Pain and distress are related to the development of restlessness and delusion after Intensive Care Unit (ICU) discharge, post-traumatic stress disorder, and chronic pain (7-9).

Analgesics and sedatives are required to control pain and suffering (10). Its side effect, decreasing consciousness and brain function, may extend the use of mechanical ventilator besides increasing the mortality and morbidity risks (8). Integrative therapies, on the other hand, such as interpersonal communication through touching, may increase sedative alertness even when keeping the rest relatively safe (10, 11). Routine care and medical intervention usually involve procedural contact, and patients may feel uncomfortable (12). On the contrary, interpersonal contact interventions, such as emotional contact and massage, aim to improve the mental state of patients. Besides, the role of human presence is becoming more imperative now in reducing fear and anxiety in ICU patients with light sedation therapy (13).

In ICU, critically ill patients are comprehensively observed, treated and cared for all day long. In this setting also, advanced technology is employed to treat, support, and monitor vital signs. The utilization of medical tools

such as mechanical ventilator, infusion and syringe pumps, monitors and dialysis complicates medical care in the ICU. In the ICU environment, the development of technology is also constantly improving, which can also clearly be seen. The ICU staff and medical equipment provided in today's hospitals significantly contribute to the better survival of critically ill patients (14).

Holistic, individualized, caring, and inspiring care are all characteristics of patient-centered care. The atmosphere in which this treatment is delivered has the greatest effect on the patient's health and well-being. One of the most critical elements of interpersonal contact is therapeutic touch. This study is aimed to create theoretical foundations for nurses' role in dealing with technology in the ICU during COVID-19 pandemic.

NURSING TOUCH

Touch is an essential part of nursing care. There are three different forms of contact used by nurses: 1) touch is used for task-oriented interaction, 2) to facilitate physical comfort, and 3) to provide emotional containment. Since the mid-1950s, researchers have looked into the advantages and social significance of contact, and they've discovered that patients have a stronger need for touch during disease or psychological distress. Researchers intend to investigate the sense of contact and its psychological and social effect, including encouragement and assistance since 1990 (15-17). It has been suggested that certain patients may have a greater need for contact due to being isolated and separated from their families due to chronic pain, terminal illness, or age (17).

Touching is a powerful nonverbal communication method that may calm the touched person if used correctly and interpreted positively (18). Touch is an integral part of caring and used to indicate sympathy, consideration, intimacy, comfort, and presence. On the other hand, the most effective contact method with dying patients is the "gentle pressure" of the hands. Therapeutic touch is an ability that can be acquired over time and through role modelling (17). Physical touch gives patients a sense of self-worth, improves patient-nurse interaction, decreases the severity of psychosocial issues, and positively impacts physical recovery by lowering blood pressure and pulse. Physical touch has been shown to reduce physiological parameters, including blood pressure, respiratory rate, and pulse, while also increasing the heart rate (19).

The COVID-19 pandemic has undoubtedly impacted how health care providers use touch to express their concerns and care. For instance, nurses are not allowed to hug a weeping parent to console them or put their hand on theirs to convey empathy or pat on patient's shoulder who has just been diagnosed with a terminal illness. The misery caused when the need for comfort

is not met is worsened by relatives prohibited to say goodbye or contact their loved ones during the answer to COVID-19. These gestures may have been impulsive and voluntary in the past. Still, they are no longer possible in many clinical settings due to physical distancing rules and the use of personal protective equipment (PPE) (20).

PPE, especially face masks and gloves, can create an additional barrier to communication and compassion expression. The face is the most effective tool in social communication because it expresses one's emotions such as joy, fear, awe, disgust, and rage which another person can perceive. This type of communication is impaired when a great distance separates two people or their faces are hidden (21).

HIGH TECHNOLOGY

In this International Year of the Nurse and Midwife, World Health Day emphasizes the current state of nursing and midwifery internationally. There are 27.9 million nurses in the world, with 19.3 million of them being licensed nurses. Regrettably, the world lacks a global nursing workforce capable of meeting universal health coverage and Sustainable Development Goal (SDG) (22).

Today, the World Health Organization (WHO) released the State of the World's Nursing Report 2020 today, recommending to utilize the report's results and establish an agenda that will accelerate and maintain change through 2030. The study will encourage the government and all parties to adapt technology and evolve integrated health and social care models. According to the WHO survey, technology is constantly being used in both nursing education and practice. Technology is utilized to support a clinical decision, perform telemedicine, training, and consultation, promoting access, allowing remote care, improving health care services, and empowering patients. According to the study, nurses are required to follow the course about the digital determinants of health, which encompass their level of digital literacy, technical facilities, and Internet infrastructure, including broadband, were accessible (23).

It's possible that the reasons for using technology in nursing care aren't ethical. When using electronic documents and sharing patient information between various health care facilities, protecting privacy is a major concern. Everyone who works with electronic patient data must be aware of the rules to protect the patient's privacy. Also, healthcare service providers must have a mechanism in place to track privacy implementation in their domain. In nursing, technology can lead to inequity in treatment. For example, various jurisdictions provide different services to residents, so certain patients may be unable to use the same technology due to a lack of expertise or appropriate equipment (23).

A decrease in nurse workload was a common result. The advent of electronic medical records increased access to their patient's health information, resulting in shorter take-over times. Another research discovered that technical devices speed up the completion of nursing tasks, reducing nurse fatigue and workload (24). Nurses believe computer technology makes their jobs easier. It affects time management, documenting, making fewer paperwork, and easy editing patient health records, among other things (25).

One of the key reasons nurses use information systems in their work is that they believe information technology enhances their work efficiency. Other studies have shown that information technology is a helpful tool and a significant factor influencing the workflow, procedures, and flow of information among nurses and other health care professionals in clinical settings (26, 27).

Only 25.8% of the participants believe that using technology in critical care units causes stress and burnout among nurses. Furthermore, most nurses have a good attitude toward emerging technologies (28). Nurses can experience negative feelings as a result of their use of technology in the nursing profession. Nurses are feeling incompetent and insecure due to a lack of experience (29). Nurses can become demotivated due to a lack of technical support. Nurses' job satisfaction is often harmed by defective equipment and colleagues who misuse existing devices. If all team members do not have the same standards about how they can use technology, tension will occur (30).

According to the surveys, many nurses believe there are issues and dangers associated with the use of technology. Problems occur due to a lack of needed equipment or services and inadequate equipment (29, 31). Technical support and proper training to use the equipment were also seen as significant (28). If the technological systems are handled improperly or if the staff does not correctly interpret the data in the machines, the use of technology will put patients at risk (23).

QUALITY OF CARE

World Health Organization (WHO) describes Quality of Care (QoC) as "the degree to which health care services given to individuals and patient populations enhance desired health outcomes." Health care should be safe, efficient, punctual, adequate, and patient-centred in order to achieve this goal (32). Interpersonal touch may provoke neuroendocrine effects and relieve stress. Therefore, interpersonal touch is a part of Quality of Care (QoC) (33).

DISCUSSION

Interpersonal contact in the nurse-patient relationship is used to express desires, provide warmth, reduce tension, and show intimacy, which benefits both the patient and

the nurse. For all patients ranging from neonates in the Neonatal Intensive Care Unit (NICU) to dying elderly people in the medical/surgical ICU, the need for human contact is universal (34). Several studies reveal that providing high touch and high technology in nursing care to ICU patients and their family significantly affect them in three areas: 1) providing physical and psychological comfort for patient in distress; 2) enhancing the physical and psychological well-being of patients and their relatives; and 3) improving family satisfaction with care provided and decision making in ICU (34, 35).

The need for human contact is hardwired into nurses' DNA. Nurses acknowledge that some ICU nursing procedures, such as infusion therapy or suctioning, may be terrifying for some patients, regardless of age, level of treatment, or length of stay. Whether it's putting nurse's hands on patient's or making good eye contact, human touch can go a long way as to calm fears and tend temperatures. The pandemic has drawn attention to the significance of nurse's role in patient care, but nurses do it all the time. Nurses in all areas of life have responded to the call to care for COVID-19 infected patients. From direct care provider, administrator, educator, to the researcher, all nursing positions contribute to patients' lives, fellow nurses, and community. Touching enables professionals to communicate in ways that go "beyond words", at its core, it expresses humanism (36). With limited, insufficient, or unnecessary verbal communication, touch may be ready to assist distressed patients.

COVID-19 has drastically altered a practice that was once commonplace. Nurses are used to wearing Personal Protective Equipment (PPE) such as face shields, masks, gloves, and gowns, but there have been other difficulties during this pandemic. All health care staff must also wear personal protective equipment (PPE) because of the importance of infection control principles in caring for COVID-19 patients. It can be challenging to communicate with patients, particularly while wearing an N-95 mask. When delivering education and directions, special care will be taken to ensure that the patient can engage and understand what is being said. Nurses must also take noise in ICUs into consideration and its effect on the patient.

Limiting the frequency of individual visits to patient's room is a technique for restricting virus spread; even so, the patient may feel isolated due to that one. Hospital visitor policies have changed over time, but when patients are allowed to have any visitors, healthcare providers are the only human patient to contact. Cell phones or tablets are recently used to help the patient to communicate.

Nursing is described as the "diagnosis and treatment of human responses to highly technological procedures, conditions, and systems used in the delivery of health

care,” according to the American Nurses Association’s Public Policy Statement on the Scope of Nursing Practice (37). Being sick and the possibility of becoming technologically isolated are direct assaults on some of the most prized qualities. Although people’s reactions differ in severity, some are so universal that they can genuinely be considered human responses (i.e., rooted in our shared humanity).

Patients and their relatives want and expect nurses to be knowledgeable about technology in healthcare environments. Still, they also wish nurses to be a compassionate conduit between technology and the patient. Indeed, several recent advances encourage nurses to consider new and innovative approaches to nursing practice. Nurses agree that healing involves human contact, if not directly than in the nurse’s bearing witness to the patient’s experience, in our presence. When patients communicate that they feel heard and valued, nurses know they are completely present with them. When nurses consider the inherent dangers of technology’s potentially dehumanizing impact, it becomes even more critical that nurses address the personal dimension.

A walk down a hospital hallway will show nurses staring at computer screens, noting relevant lab values, reviewing physician orders, and entering vital signs and other clinical details. Some argue that it’s an either-or dilemma in which nurses must prioritize new technologies over the humanistic aspect of nursing. However in this pandemic era, technology is most useful technique to connect patient and family but somehow humanism seem to be opposed.

There is no doubt that ICU nursing services in the pandemic era are highly dependent on technological sophistication. In daily life, ICU nurses are familiar with the use of technology in the form of high tech and life support devices. However, the COVID-19 pandemic has forced nurses to further interact with technology to address the barriers created in patient and family relationships. The growing interaction of nurses with technology, for example for family education by video call, is precisely as if direct contact between nurses and patients were reduced. We point out that the nurse sits at the crossroads of this technology-humanism divide, but fostering the merging of these ideologies isn’t easy. It necessitates both compassion and awareness and is aided by education, clinical practice, research, and administrative support.

Professional nurses have a role as therapeutic agents. In doing so, the role requires a relationship and emotional commitment not only from the nurse but also the patient. That commitment called genuine human caring, which means a nurse’s sense of care, sense of responsibility and a willingness to help the patients. Caring for a nurse is divided into humanistic caring, professional caring

and scientific caring (38). Departing from the meaning that nursing therapy is a composite interventions, the provision of nursing care must be carried out continuously, 24 hours a day, 7 days a week, by several nurses. So, the provision of nursing therapy must involve a professional nurse who will be responsible for all nursing care that provided. The purpose of this nursing therapy is changing the behaviour of the patient and their family to become more independent as a result of the application of partnership, intimacy and reciprocity. Thus, nursing therapy is a unique intervention that owned by nursing professionals.

Professional nursing therapy has not been fully provided in the field due to several factors, like the terms of service, education and technology. In the terms of service, the problems include unsustainable nursing care, uneven empowerment between vocational graduates and nurses, and insufficient needs of nurses. Meanwhile, from an educational perspective, the problem is nursing graduates who are not optimally prepared to be able to perform nursing therapy. Nowadays, the nursing care that provided in the field is not yet fully considered as professional nursing care because the patient has not received professional nursing therapy.

The American Association of Colleges of Nursing has established Guidelines for Incorporating Technology into Professional Nursing Education to address the value of nurses learning the expertise and skills required to use devices safely and appropriately. Also, nursing education must consider ethics and principles to data collection and care delivery. Nurse managers and administrators are in charge of creating environments that allow for patient-centered and technologically skilled nursing care. The nurse-patient partnership would benefit from systems that integrate humanistic values of respect, trust, and autonomy in interactions between administration and staff. Nurses need ongoing training to help them develop and remain confident in the technologies and better understand and meet the emotional needs of their patients.

CONCLUSION

In nursing research on technology and nursing practice, nurses must emphasize the importance of lived experience with technology. In addition, the well-being of the patient is what motivates the use of technology. Nurses must be able to provide appropriate care through high technology without forgetting the value of nursing itself, which is manifested in the form of therapeutic touch.

REFERENCES

1. World Health Organization. Global Surveillance for human infection with coronavirus disease (COVID-19). 2020.

2. Liang W, Guan W, Chen R, Wang W, Li J, Xu K, et al. Cancer patients in SARS-CoV-2 infection: a nationwide analysis in China. *Lancet Oncol*. 2020;21(3):335-7.
3. World Health Organization. WHO Coronavirus (COVID-19) Dashboard. 2021.
4. Fernández-Castillo R-J, González-Caro M-DRN, Fernández-García E, Porcel-Gómez A-M, Garnacho-Montero J, Virgen Macarena H, et al. Intensive care nurses' experiences during the COVID-19 pandemic: A qualitative study. *Nursing in Critical Care*. 2021;1-10.
5. Shang Y, Pan C, Yang X, Zhong M, Shang X, Wu Z, et al. Management of critically ill patients with COVID-19 in ICU: statement from front-line intensive care experts in Wuhan, China. *Ann Intensive Care*. 2020;10(73):1-24.
6. Arabi YM, Azoulay E, Al-Dorzi HM, Phua J, Salluh J, Binnie A, et al. How the COVID-19 pandemic will change the future of critical care. *Intensive Care Med*. 2021;47(3):282-91.
7. Morrissey M, Collier E. Literature review of post-traumatic stress disorder in the critical care population. *Journal of Clinical Nursing*. 2016;25(11-12):1501-14.
8. Reade MC, Finfer S. Sedation and Delirium in the Intensive Care Unit. *N Engl J Med*. 2014;370(5):444-54.
9. Papathanassoglou E, Park T. Recent advances in understanding pain: What lies ahead for critical care? : Blackwell Publishing Ltd; 2014. p. 110-3.
10. Papathanassoglou E, Park T. To put the patient in the best condition: Integrating integrative therapies in critical care. Blackwell Publishing Ltd; 2016. p. 123-6.
11. Harris SJ, Papathanassoglou EDE, Gee M, Hampshire SM, Lindgren L, Haywood A. Interpersonal touch interventions for patients in intensive care: A design-oriented realist review. *Nurs Open*. 2018;6(2):216-35.
12. Samuelson KAM. Unpleasant and pleasant memories of intensive care in adult mechanically ventilated patients-Findings from 250 interviews. *Intensive and Critical Care Nursing*. 2011;27(2):76-84.
13. Baumgarten M, Poulsen I. Patients' experiences of being mechanically ventilated in an ICU: A qualitative metasynthesis. *Scandinavian Journal of Caring Sciences*. 2015;29(2):205-14.
14. Tunlind A, Granström J, Engström E. Nursing care in a high-technological environment: Experiences of critical care nurses. *Intensive and Critical Care Nursing*. 2015;31(2):116-23.
15. Bottorff JL. The use and meaning of touch in caring for patients with cancer. *Oncol Nurs Forum*. 1993;20(10):1531-8.
16. Adomat R, Killingworth A. Care of the critically ill patient: the impact of stress on the use of touch in intensive therapy units. *J Adv Nurs*. 1994;19(5):912-22.
17. Pedrazza M, Berlanda S, Trifiletti E, Minuzzo S. Variables of Individual Difference and the Experience of Touch in Nursing. *Western Journal of Nursing Research*. 2018;40(11):1614-37.
18. Fry M, MacGregor C, Ruperto K, Jarrett K, Wheeler J, Fong J, et al. Nursing praxis, compassionate caring and interpersonal relations: An observational study. *Australasian Emergency Nursing Journal*. 2013;16(2):37-44.
19. Arslan S, Ozler N. Touching, music therapy and aromatherapy's effect on the physiological situation of the patients in Intensive Care Unit. *International Journal of Caring Sciences*. 2016;9(3):867-75.
20. Pattison N. End-of-life decisions and care in the midst of a global coronavirus (COVID-19) pandemic. Churchill Livingstone; 2020. p. 102862.
21. Jack RE, Schyns PG. The Human Face as a Dynamic Tool for Social Communication. Cell Press; 2015. p. R621-R34.
22. World Health Organization. WHO and partners call for urgent investment in nurses. 2020.
23. Haikkala J, Ruotsi O, Rutanen O. Perceptions of nurses about the use of technology in nursing 2019.
24. Kim S, Lee K-H, Hwang H, Yoo S. Analysis of the factors influencing healthcare professionals' adoption of mobile electronic medical record (EMR) using the unified theory of acceptance and use of technology (UTAUT) in a tertiary hospital. *BMC medical informatics and decision making*. 2016;16:12-.
25. Sibandze BT, Mallinson KR. Experiences of Professional Nurses Using Computer Technology in the Intensive Care Unit Setting in Swaziland. *Africa Journal of Nursing and Midwifery*. 2018;19(2):13 pages.
26. Nazi KM. The personal health record paradox: health care professionals' perspectives and the information ecology of personal health record systems in organizational and clinical settings. *Journal of medical Internet research*. 2013;15(4):e70-e.
27. Sharifian R, Askarian F, Nematollahi M, Farhadi P. Factors influencing nurses' acceptance of hospital information systems in Iran: application of the Unified Theory of Acceptance and Use of Technology. *Health information management : journal of the Health Information Management Association of Australia*. 2014;43(3):23-8.
28. Sirois P, Fournier H, Lebouthillier A, Guerette-Daigle L, Robichaud S, Leblanc-Cormier G, et al. Nurses' perceptions and attitudes towards new ADU technology and use. *Technology and health care : official journal of the European Society for Engineering and Medicine*. 2013;21(1):41-7.
29. Sibandze BT, Mallinson KR. Experiences of Professional Nurses Using Computer Technology in the Intensive Care Unit Setting in Swaziland. *Africa*

- Journal of Nursing and Midwifery. 2018;19(2):13 pages- pages.
30. Holtz B, Krein S. Understanding Nurse Perceptions of a Newly Implemented Electronic Medical Record System. *Journal of Technology in Human Services*. 2011;29(4):247-62.
31. Wright J, Honey M. New Zealand nurses' experience of tele-consultation within secondary and tertiary services to provide care at a distance. *Nursing Praxis in New Zealand*. 2016;32(2):30-8.
32. World Health Organization. Quality of care. 2018.
33. Papathanassoglou E, Mpouzika MDA. Interpersonal Touch: Physiological Effects in Critical Care. *Biological Research for Nursing*. 2012;14(4):431-43.
34. Nist MD, Harrison TM, Tate J, Robinson A, Balas M, Pickler RH. Losing touch. *Nursing Inquiry*. 2020;27(3):e12368.
35. Davis TM, Friesen MA, Lindgren V, Golino A, Jackson R, Mangione L, et al. The Effect of Healing Touch on Critical Care Patients' Vital Signs: A Pilot Study. *Holist Nurs Pract*. 2020;34(4):244-51.
36. Kelly MA, Nixon L, McClurg C, Scherpbier A, King N, Dornan T. Experience of Touch in Health Care: A Meta-Ethnography Across the Health Care Professions. *Qualitative health research*. 2018;28(2):200-12.
37. American Nurses Association. Nursing scope and standards of practice. Maryland: Nursesbooks.org; 2015.
38. McMahon R, Pearson A. Nursing as therapy. 1 ed. New York: Springer US; 1991.