



Theory of Comfort and Technological Innovations in Healthcare: A Review of Katharine Kolcaba's Perspective in Nursing Practice

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Abstract: There have been changes in the management of patients' medical and health conditions due to increasing digital innovations. To name a few of these innovations, telemedicine, health apps, wearable technologies, mobile health, and artificial intelligence were notable digital transformations in healthcare. The integration of technological innovations provides a promising future for managing health and improving healthcare access. The objective of this review is to determine the significance of the comfort theory and the application of comfort theory, and reflect on how the comfort theory was used in today's technological health innovations. Further, this narrative review article emphasizes the comfort needs of patients from the perspective of Katharine Kolcaba's theory of comfort, looking into some aspects wherein technological advancement was integrated into their healthcare needs. During the analysis of literature and related studies, the majority of the studies presented online were concerned more with conventional care when patients are confined in the hospital, receiving care and treatment. Not much has been discussed about the comfort needs of patients receiving care and treatment through technological innovations such as telehealth or telemedicine and wearable technologies. The author hopes that this review discussion will stimulate future research endeavors concerning the technological innovations of health and the comfort needs of patients. Technological innovations in healthcare pose great challenges to providing comfort to patients receiving care and treatment through digital health tools. The author stresses the importance of paying attention to the increasing technological innovations in the healthcare sector and exploring the comfort level of patients amidst these changes in the healthcare system.

Review Paper
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INTRODUCTION

Digital transformation has taken place in the healthcare system. There have been changes in the management of patients' medical and health conditions due to increasing digital innovations. To name a few of these innovations, telemedicine, health apps, wearable technologies, mobile health, and artificial intelligence were notable digital transformations in healthcare. Along with the increasing transformation of medical management in healthcare, a growing number of patients' health needs are significantly noted across ages. The integration of technological innovations provides a

promising future for managing health and improving healthcare access. In the modern technological world, nursing care is improving in dealing with patients' health needs and level of comfort. The objective of this review is to determine the significance of the comfort theory, and the application of comfort theory and reflect on how the comfort theory was used in today's technological health innovations. Further, this narrative review article emphasizes the comfort needs of patients from the perspective of Katharine Kolcaba's theory of comfort, looking into some aspects wherein technological advancement was integrated into their healthcare needs.

Telemedicine and telehealth, mobile health applications, and wearable technologies are commonly implemented in the current healthcare industry. Integrating digital technology enables members of the healthcare team to accurately determine patients' health problems and provide treatments. Moreover, integrating digital tools creates a personalized approach. It enhances patient care, encourages patients' full participation, and improves their way of living.

**Literature Review of Technological Innovations in Healthcare** Several articles and reviews on digital transformation in healthcare disclose technological innovation as a way of improving health delivery systems. Using a systematic bibliographic review of digital transformation in healthcare, Stoumpos *et al.* (2023) concluded that telemedicine, enhancement of digital security, and advancing technological information systems will contribute to the acceptance of digital transformation by all users. Management implications of digital health advancements, however, must be fully understood by the stakeholders. A scoping review methodology of organizational digital transformation, from evolution to future trends (Omol, 2024), identified that leadership, organizational culture, and technological enablers are essential factors of innovation and competitiveness within organizations. The findings also stressed the importance of ethics, data privacy, and security in the emergence of digital innovations. Researchers (Kaya and Bozbura, 2023) are finding that digital transformation is not only about digital technologies but also the transformation of business models and cultural change and further pointed out that more research is needed to highlight the cultural effects of digital transformation within the organization.

Furthermore, in the aspect of digital transformation in the healthcare industry, researchers (Channi H, *et al.*, 2022) concluded that the integration of digital technology appears to be limitless. Healthcare technology is applied to make patients experience the comfort they desire. Emerging technology programs and updating knowledge and skills are relevant factors to improve technology usage in the future. Research based on Delphi analysis and the opinion of a group of experts found that the Internet of Things and artificial intelligence, as well as machine learning, greatly influenced administrative support processes in healthcare organizations (Mauro M *et al.*, 2024). The authors further cited that employees' skills and competencies to operate the tools are crucial determinants of digital transformation. A systematic review study reveals that digital transformation in healthcare can lead to efficiency of care and patient treatment that would increase patient level of satisfaction. Researchers have emphasized that digital technologies are already implemented in the healthcare industry. Privacy and security of data were among its challenges amidst digital health innovation (Limna, 2023). Likewise, using a systematic review of literature,

researchers (Delice E *et al.*, 2023) indicated that the implementation of digital transformation in healthcare is continuously progressing and marking a significant change in the healthcare industry. Healthcare providers must be provided with sufficient digital infrastructure and intelligent applications.

Globally, numerous discussions, expert opinions, and scholarly articles have been produced and circulated on the internet to provide information about the modern digital healthcare sector. The digital advancement of healthcare conveys that transforming the care delivery system enables healthcare professionals to leverage updated digital tools to provide effective patient outcomes. In the nursing profession, nurses are continuously adopting the use of digital health tools as part of their management and interventions of patient care. This narrative review is grounded in the perspective of Katharine Kolcaba's theory of comfort, which focuses on the patient's level of comfort as the primary recipient of care, along with the integration of digital health tools.

**Katharine Kolcaba's Major Concepts & Definitions** Nurse theorist Katharine Kolcaba specified that those receiving comfort can be referred to as recipients, patients, students, prisoners, workers, older adults, communities, and institutions (Alligood, 2018). Kolcaba highlighted that in today's modern technological world, providing comfort is even more essential. The advent of technological transformation is one of the stressors that people around the world may experience, and comfort is the antidote to facing these challenges.

One of the concepts of Katharine Kolcaba is healthcare needs. These needs address the comfort caused by stressful events by the recipients, which cannot be provided by the traditional support system. These needs can be physical, psychospiritual, sociocultural, or environmental. These needs can be felt through monitoring, verbal and non-verbal reports, pathophysiologic limitations, education and support, and financial counseling and intervention (Alligood, 2018).

Comfort interventions, on the other hand, Kolcaba demonstrated that these are nursing actions that address the comfort needs of the recipients. Intervening variables is another concept emphasized by Kolcaba. These variables are interacting forces that affect the level of perceived comfort by the recipient. These forces can be categorized as demographic variables such as age, experiences, attitude, emotional state, support system, finances, prognosis, educational background, and the totality of elements experienced by the recipients. Further, Kolcaba considers these intervening variables as those that influence the planning and success of patient interventions. The concept of comfort is demonstrated as the immediate state experienced by the recipients as a result of comfort interventions. Comfort is a holistic experience when needs are attended to and addressed well by the caregivers. Kolcaba noted the three types of

comfort such as relief, ease, and transcendence. Relief is when the nurse relieves the needs as expressed by the recipients. The concept of ease is to be maintained while providing the basic functions of the patients, and the transcendence is when the recipients rise above difficulties through the help of the nurse.

In terms of the health-seeking behaviors of the recipients, Kolcaba defined the concept as a broad category of outcomes about health. These categories of health could be internal behavior or those things that people cannot see. External behaviors, on the other hand, are those things that can be directly seen or observed. A peaceful death is defined by Kolcaba as when conflicts are resolved, symptoms are managed, and death is accepted by the patient and family members and allowing the patient to quietly die with dignity.

Katharine Kolcaba highlighted institutional integrity as one of the major concepts of the theory of comfort. Corporations, schools, communities, regions, states, and countries that possess the quality of being complete are paramount to institutional integrity. Having this integrity means best practices and best policies are highly exercised and maintained. Best practices are demonstrating nursing actions based on evidence to produce the best possible patient and family outcomes. Best policies range from protocols for procedures and medical conditions to access and delivery healthcare to the recipients. As to the empirical evidence of Katharine Kolcaba's theory of comfort, the clear message of the theory is that comfort is multi-dimensional, meaning comfort is experienced by different things to different people across life ages.

Related Studies of the Theory of Comfort In July 1994, Katharine Kolcaba, in her published work on the theory of holistic comfort for nursing, highlighted the significance of comfort. In the nursing profession, comfort is one of the essential characteristics of being a nurse. In conclusion, the understanding of comfort directly guides nursing care in terms of physical, psychospiritual, social, and environmental interventions. These interventions focus on holistic comfort that can be rendered during patient-to-nurse interactions. The theory of comfort provides direction for nursing practice and research because it includes outcomes that are measurable, holistic, positive, and nurse-sensitive. A study on the application of Katharine Kolcaba's comfort theory to the nursing care of a patient was excellent and result-oriented when it was applied to a young surgical patient in the clinical setting. The strength of the comfort theory covers fulfilling the holistic comfort needs of the patients (Awal, 2017). A randomized controlled trial protocol focusing on the effectiveness and safety of implementing an enhanced patient comfort program for elective neurosurgical patients (Liu B *et al.*, 2023) discusses that it is imperative to consider patients' perceptions. Patient satisfaction and comfort with communications, physical comfort, pain control, and

hospital environment are essential indicators of care quality. The researchers positively agree with the concept that comfort is a dynamic and multidimensional state.

In another investigation, Wilson and Kolcaba (2004) studied the practical applications of comfort theory in the perianesthesia clinical setting. The authors demonstrated the comfort care actions such as standard comfort interventions, coaching, and comfort food for the soul that can be exhibited through therapeutic touch, music therapy, spending time with the patient, and personal connections. Comfort needs are proactive, energized, intentional, and longed for by patients and families in all settings. Comfort is an important indicator for measuring the health needs of patients and families for perianesthesia nursing care. In a reflection study of the theoretical contribution of comfort to nursing practice, the authors consider that comfort occurs through care during nurse-to-patient interactions resulting from the person's uniqueness and the competence of the person who provided comfort to the patients. However, the authors stressed that further research is recommended to investigate the comfort experienced by the person by considering different types of study and research methodology (Martins A *et al.*, 2022).

Using a sample of one hundred twenty-six women, a study of the effect of comfort theory-based nursing care on pain and comfort in women undergoing hysterosalpingography utilizing a randomized controlled trial found that the comfort theory-based nursing care was effective in increasing women's comfort with painful invasive procedures (Bal and Kulakac, 2023). A qualitative, phenomenological approach to stories of the eight elderly about Katharine Kolcaba's theory of comfort found that the elderly find comfort in the care directly provided to them, however, it does not reach a full degree of well-being (Gaibor D *et al.*, 2021). Drawing upon the parents of patients with cerebral palsy on their child's comfort, quality of life, and parents' self-efficacy, Berberoglu and Calisir (2024) concluded that the structured supportive approach based on the theory of comfort enhances children's comfort and quality of life and increases parents' self-efficacy.

Implications for Nursing Administration and Nursing Practice With today's technological innovations, there is a growing number of patients seeking help and comfort for their health conditions. From the perspective of Katharine Kolcaba, addressing the comfort needs of patients lies mainly in the competencies provided by nurses during nurse-to-patient interaction. Nurses should also consider the comfort level of their patients who receive medical attention and care through health technological tools utilized by the institution, such as telemedicine, artificial intelligence, and different kinds of wearable technologies for the patients. These patients need comfort, especially those with limited knowledge

regarding the use of the technology. The theory of Katharine Kolcaba demonstrated that comfort is multidimensional, which is experienced by different things by different people. Hence, regardless of aspects of life, be it in conventional care or care that is integrated with technological tools, comfort needs must predominate in all aspects of life.

The nursing administrators will continue to align technology use and prioritize the comfort needs of the patients as recipients of care. As leaders and managers in the nursing practice, balancing the integration of technology as part of nursing care and the comfort needs of the patients is necessary to attain a satisfying and comforting life despite technological innovations.

#### Author's Insight of the Review

Given the current state of technological innovations in the healthcare industry, addressing the comfort needs of the patients is crucial to attaining quality patient outcomes. The ultimate objective of this review is to find out the universal application of the comfort theory as postulated by Katharine Kolcaba. During the analysis of literature and related studies, the majority of the studies presented online were concerned more with conventional care when patients are confined in the hospital, receiving care and treatment. Not much has been discussed about the comfort needs of patients receiving care and treatment through technological innovations such as telehealth or telemedicine and wearable technologies. The author hopes that this review discussion will stimulate future research endeavors concerning the technological innovations of health and the comfort needs of patients.

#### Limitation of the Review

This narrative review article does not follow a systematic review model and may, therefore, be subject to selection bias. However, care was taken into consideration to include pieces of literature and related studies that will substantiate the understanding of the review article.

## CONCLUSION

The comfort theory by Katharine Kolcaba is widely accepted as one of the characteristics of providing nursing care. Addressing comfort needs increases life satisfaction and positive well-being. The technological innovations in healthcare pose great challenges to providing comfort to patients receiving care and treatment through digital health tools. However, despite the studies that have been conducted, the author stresses the importance of paying attention to the increasing technological innovations in the healthcare sector and exploring the comfort level of patients amidst these changes in the healthcare system.

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