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Cognition and expansion of nursing science: A response to the discussion paper entitled “At the intersection of science and theory: How the Nurse Role Integration Model reconciles the conflict”



“Should research using animal models be included in the field of nursing science study?” When asked by colleagues during her Ph.D. program, Sharon G. Casavant, a student at the University of Connecticut School of Nursing, realized she was not prepared to answer. This question inspired her to embark on a self-reflection journey regarding nursing roles and subsequently create the Nurses’ Role Integration Model adapted from the Neuman Systems Model. In this model, Casavant identifies research such as investigation using animal models, collecting human clinical biomarkers, and clinical data analysis as primary prevention under the heading Science of Nursing, reflecting the nurse’s work. The findings of primary prevention lead to secondary prevention, which is the development of innovative treatments or interventions. Primary and secondary prevention leads to tertiary, which is when the nurse policy activist lobbies legislators to adopt new policies that will improve patient care [1]. Casavant’s theory is meaningful for self-cognition and nursing science extension, even though further description is needed. Meanwhile, let us return to the question “should research using animal models be included in the field of nursing science study,” which is the focus of this correspondence. We hope this controversy that is confusing many colleagues in the field of nursing science could be resolved.

An animal disease model is a living, often genetically-engineered animal that exhibits human disease [2]. Animal models are widely used in scientific research in fields such as physiology, pathology, pharmacy, experimental medicine, etc. In the current stage, animal models have been applied during the investigation and research of diseases such as diabetes, atherosclerosis, tumor, and dementia to better understand the disease, develop treatments, and explore preventive strategies. The prevention, occurrence, development, and treatment of disease involve a cascade of complicated mechanisms and are affected by various internal and external factors. Using an actual human as the model during disease research is usually challenged with ethical problems and the risk of harming the subject. Meanwhile, the experiment design with the human model is limited because many diseases exhibit characteristics such as long latent periods, slow progression, and low incidence. Thus, conducting research with the designated animal model with an ideal phenotype that can be easily controlled, grouped, treated, and observed will help us study the mechanism of disease, test anti-disease and prevention strategies, and facilitate the advances of medical science.

Nevertheless, we must acknowledge that the animal disease model is just one of the various research methods, of which the purpose is to achieve experimental goals. The application of animal disease models should not be restricted to some specific disciplines. Similar to the inter-disciplinary application of methods such as statistical analysis and mathematical modeling, it is reasonable to apply the animal disease model during research of nursing science, which is a branch of comprehensive applied science built on natural science and social science. To date, experiments conducted with animal models have been applied during world-wide nursing researches [3–6]. The School of Nursing of the Army Medical University (Third Military Medical University) has proposed master and Ph.D. projects involving a number of fascinating nursing science studies designed with cell models and animal models exploring the mechanism, strategy, and application of various topics, including learning and memorizing [7,8], exercise rehabilitation [9], trauma and burn nursing [10,11], cancer nursing [12], and enteral nutrition [13]. Furthermore, techniques utilized in the field of cell morphology, molecular biology, and bioinformatics should also be applied during the nursing science investigations.

Furthermore, it is crucial to be mindful of the animal model’s limitations or any other methodology to conduct scientific research appropriately. In the current stage, neither cell model nor animal model is capable of manifesting the actual situation of diseases in humans, and thus these models are used to indirectly study the mechanism of the disease [14,15]. On the one hand, the animal model is easily controlled, which ensures the efficiency of potential interventions; on the other hand, the animal model over-simplifies the complexity of people and society. Therefore, the interventions tested in the animal model may lead to different phenomena in humans and eventually will need to be verified using a clinical model. Indeed, the ultimate goal of any experiment model is to promote human health.

The core concept of nursing science is composed of people, environment, health, and nursing. The rationale for conducting nursing science research is the demand for better treatments and interventions for our communities. By improving the validity, reliability, repeatability, and accuracy of nursing science studies with methods like the animal disease model, we can provide a quantifiable and measurable scientific basis for nursing practice [16]. Therefore, as researchers in nursing science, we should not limit our studies to be focused only on society and humanity. We should expand our vision by exploring the correlation between the nursing science and the other branches of science, and thus sustainably develop

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the theoretical frameworks and practice guidelines of nursing science on the premise of cross-linking with other disciplines.

Years ago, some people queried, “why do nurses do scientific research?” as they believed that the role of nursing was simply accomplishing clinical nursing service. With the evolution of inter-disciplinary teams, it is now widely accepted that nursing science is integral to clinical nursing. However, whether methods of other disciplines should be applied to nursing science has confused practitioners in the field. In the long-term perspective, the core concept of nursing has developed from disease-based to health-based with the growth of interdisciplinary teams and the expansion of nursing theory; as such, the methodology of nursing science should not be limited by rigid and perhaps out-date constraints.

Declaration of competing interest

The authors declare that there is no conflict of interest.

References

- [1] Casavant SG. At the intersection of science and theory: How the Nurse Role Integration Model reconciles the conflict. *Int J Nurs Sci* 2020;7(3):378–81. <https://doi.org/10.1016/j.ijnss.2020.06.005>.
- [2] Cunningham SG, Mitchell PH. The use of animals in nursing research. *ANS Adv Nurs Sci* 1982;4(4):72–84.
- [3] Zhuang JY, Song JH, Jiang XY, Xia PC, Ye JJ, Wang LX. An SD rats animal model for pressure ulcer study. *Chin J Mod Nurs* 2010;(36):4363–5 [in Chinese].
- [4] Aisilahong GHE, Maimaiti LD, Wu YY, musha SDTH, Shu JJ. Effect of rehabilitation nursing intervention on the rat model of joint contracture. *Chin J Prac Nurs* 2020;36(18):1415–20 [in Chinese].
- [5] Rowsey PJ. Using Animals in nursing research: bridging gaps between bench, bedside, and practice. *West J Nurs* 2015;37(12):1515–6.
- [6] Hauglum SD, Crenshaw NA, Gattamorta KA, Mitzova-Vladinova G. Evaluation of a low-cost, high-fidelity animal model to train graduate advanced practice nursing students in the performance of ultrasound-guided central line catheter insertion. *Simul Healthc* 2018;13(5):341–7.
- [7] He L. The effects of estrogen receptor beta activity modulation on hippocampal actin polymerization and learning and memory of female mice (master's thesis). Chongqing, China: Third Military Medical University; 2017 [in Chinese].
- [8] Li F. Effects of two drugs on the brain development induced by alcohol exposure in mouse (master's thesis). Chongqing, China: Third Military Medical University; 2017 [in Chinese].
- [9] Song BY. The effect of nursing intervention on the motor function of rats after spinal cord injury (master's thesis). Chongqing, China: Third Military Medical University; 2014 [in Chinese].
- [10] Ren W. Effect of LED red/blue light on wound healing of combined radiation-trauma injury. master's thesis. Chongqing, China: Third Military Medical University; 2013 [in Chinese].
- [11] Liu X. Clinical study on plasma biomarkers of burn sepsis and analysis of nursing interventions (master's thesis). Chongqing, China: Third Military Medical University; 2014 [in Chinese].
- [12] Luo Y. The roles of mi R-574-5p, Gomafu and QKI in cervical cancer cell proliferation and migration as well as a few nursing intervention studies (Ph.D. dissertation). Chongqing, China: Third Military Medical University; 2014 [in Chinese].
- [13] Ma YY. Lactobacillus acidophilus exerts neuroprotective effects in mice with severe traumatic brain injury via gut-brain axis and its revelation to nursing (Ph.D. dissertation). Chongqing, China: Army Medical University; 2019 [in Chinese].
- [14] Xu L. Animal models of human diseases. *Zool Res* 2012;32(1):1–3 [in Chinese].
- [15] Li ST, He L. Issues to be considered when replicating animal models of human diseases. *J Diseases Monitor & Control* 2015;9(9):637–8 [in Chinese].
- [16] Luo Y. Review and prospect of the application of basic medical research technology in nursing research. *Chin J Prac Nurs* 2019;(29):2241–4 [in Chinese].

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