

The Future of Robots in the Nursing Profession

Destiny Johnson

In the movie, *I, Robot*, released in 2004 and directed by Alex Proyas, a conspiracy by highly intelligent robots almost leads to the enslavement of the entire human race. When it comes to the conversation of robots and their role in society, movies like this can strike fear into people's minds; however, despite this fear, the use of robots is becoming increasingly prevalent in everyday life. Robots are defined by *Forbes* as "any nonliving object that receive an objective, sense their environment, take an action, and achieve their objective" (Campbell). Robots are being used in a vast range of areas expanding from something as simple as cleaning floors to something more complex, such as self-driving cars. The nursing profession is among these areas as well and there is quite a dispute over whether robots should be used or not. At the heart of this controversy, there are two main sides: those who feel that robots should not be used in the nursing profession and those who feel that robots should be used as an aid to nurses. Throughout my paper I will look at how robots could be beneficial in pediatric nursing, general nursing, and geriatric nursing, while also addressing some counterarguments for each of these branches of nursing. Because of the many benefits to both patients and nurses that result from robots being used in different areas of nursing, robots should be incorporated into the nursing profession; however, they should assist the nurses, not replace them.

When debating whether robots should be used in the nursing profession, it is important to look at different branches of the profession, including pediatric nursing, the branch of nursing that focuses on children. Many studies have been done on how pediatric nurses feel about robots being used in their profession and in what ways they would be beneficial. In their article "A Survey of Nurses' Need for Care Robots in Children's Hospitals: Combining Robot-Care, Game-

Care, and Edu-Care,” Meiling Jin and Jeongeun Kim conducted a specific study that examines how care robots could be beneficial and the need for robot-care, game-care, and education-care in children’s hospitals. The study found that using care robots could be emotionally beneficial to the children if the robot had a speaking feature that would allow it to say a few kind or calming expressions that children like. One participant of the study expressed that “robots could even say, ‘Hi, nice to meet you,’ when children are hospitalized and flocks of nurses arrive right away to take readings, such as height, weight, blood pressure, and body temperature” (Jin and Kim 353). When a child is rushed into a hospital, often they are separated from their parents at first and are moved around quickly to get all their vital information recorded. Even if they are not being rushed, they still are moved from place to place to have information taken down, which can be overwhelming for a child. If it is a matter of urgency, usually the nurse's primary goal is to make sure the patient stays alive, so they cannot always focus on helping the patient relax emotionally. Here, the robot could be the emotional stability that the patient needs in the chaos. By stepping into the role of being a friend, the robot could help the child relax, saving the nurses lots of time because the child will already be calm when the nurses ask them questions.

Another benefit of using robots to assist pediatric nurses is to communicate with and educate both the children and their parents at the time of arrival and departure. Meiling Jin and Jeongeun Kim’s study found that:

Educating children and their guardians at the time of admission and before discharge was a basic, repetitive, and time-consuming task; teaching patients and their guardians to manage infection and prevent falls and pressure injury was another basic educational task that required a significant amount of time. The nurses suggested that robots could explain

these topics more effectively by amusing and engaging the child patients and helping them concentrate on the educational session. (Jin and Kim 355)

When a child arrives at or leaves a hospital, both parents and child probably have a lot of concern over what is occurring and what to do next, and so naturally they will ask what is going on. The time that it takes for the nurses to explain everything is time they could be spending helping the child or other patients. The unique aspect about robots that would make them the perfect fit for the job of educating the children and their parents is that they can make it fun and entertaining. For the parents, the information can be presented by the robot concisely, and the robot could possibly even provide print outs for the parents to take home for reference. For the children, the information could be presented in the form of a game they could play in order to learn about their situation or different tasks they might have to do going forward. In both cases, the robot allows for the person learning to move at their own pace; if the person is confused about anything, the robots are not concerned as much with the clock and can take the time to further elaborate where needed. Overall, it seems that robots' benefits would extend to children and their parents as well as the nurses. The children and parents would benefit from the robots both emotionally and educationally. As a result of this, the nurses would also benefit from the amount of time that would be saved by allowing the robots to assist them.

Before I go any further, I want to address some concerns that might have come up thus far with the discussion of robots being used in pediatric nursing. When the word "robot" is used, almost everyone is going to have a different image come to mind, usually a product of their emotions and past experiences associated with robots. If someone has had frightening experiences with a robot, they might read this essay and wonder how a robot could be comforting to children. Furthermore, if the image is one constructed out of fear, then it is

probable that a person could think robots would scare the children even more and cause more work to be done on the nurses' part. Even in the study previously cited, some of the participants warned that in using humanoid robots, robots that resemble humans, "children might feel scared of [the robots] and that some patients might simply not like them" (Jin and Kim 355). I cannot say I disagree with this perspective. The idea of meeting a humanoid robot for the first time in a hospital could potentially freak a lot of children out, since again all people have different emotions and experiences regarding the concept of a robot; however, what is to say the robot must look like a human. While humanoid robots are an option and could possibly make some children feel more comfortable, other children might respond better to robots that resemble animals or something new altogether. Just as not all nurses look the same, not all robots will look the same and that is ok. The design of the robots for children's hospitals should be made with the children in mind; from there time will tell which robots are more accepted by the children. To say that children will be afraid of robots by their appearance could be true if all robots looked the same; however, that is not the case. The argument regarding fear is invalid because it becomes a case-by-case issue instead of a universal problem, considering that fear is already a pre-existing factor with nurses today.

Now that we have seen some of the benefits of robots in pediatric nursing and have addressed some issues that may have come up so far, let's examine how robots could be beneficial in general nursing, which mainly focuses on adult patients. In the article "Current Trends in Robotics in Nursing Patents-A Glimpse Into Emerging Innovations" a patent search was conducted surrounding robotics in nursing and the authors found that "the field of robotics in nursing is ripe for innovation" (Frazier 296). In other words, the opportunity for the use of robots in the nursing profession is at its prime time right now. In order to cultivate this

opportunity properly, the nurses need to be the ones leading the charge when it comes to the discussion of how robots could be used to assist them. One study from the article “The Purpose of Bedside Robots: Exploring the Needs of Inpatients and Healthcare Professionals” did just that by surveying healthcare professionals and even the inpatients on where they feel the need for bedside robots is. The study found that “in particular, [the respondents] considered that monitoring patient safety and predicting events, such as accidents (ie, falls) and pressure ulcers, which can prolong patients' stays and lead to death or injury, would be quite helpful” (Lee 11). One limitation that nurses have is the inability to be in multiple places at once, and they lack the time needed to constantly watch over their patients. This would be a great area for robots to step in because they could constantly monitor the patients and signal the nurses when the patients show signs of a change in posture or that a patient is about to fall. Alarming the nurses before the event occurs could have the potential to save lives and allow the nurses to work more efficiently.

Another way robots could improve efficiency for nurses is by completing small tasks that nurses usually have to do when their talents could be used elsewhere. For example, the survey also showed that “other common desires for bedside robots were the ability to help patient support functions, such as wayfinding (ie, helping patients reach check-up rooms and notifying them of appointments), notifying patients of drug dosing and meal times, and other tools to help patients live independent lives while at the hospital” (Lee 11). These small tasks may not seem like a lot, but after a while they can build up on top of each other and become overwhelming. By allowing robots to do these small tasks, the nurses can focus their attention on the most pressing tasks, taking a load of stress off them. Not only is this beneficial to the nurses, but also to the patients, who can feel as if they have a bit more independence when getting information from a robot that tells them where to go instead of feeling like a burden for asking the nurses. By

working side by side, robots can be of assistance by meeting nurses where their limitations end as well as taking on the several small tasks that tend to build up, and they can also improve a patient's stay by making them feel more independent in addition to possibly saving their lives through precautionary warnings.

Now at this point, one question that might be pressing is the reliability of the robots. I have said that robots have the potential to save lives, which means that they hold a huge responsibility for a person's life. As most people know, technology is not exempt from making mistakes, so what would happen if a care robot made a mistake that resulted in the injury or death of a patient? This is a very heavy weighted question. In fact, it is such a difficult question to answer that a universal answer doesn't exist. In the article "If Robots Cause Harm, Who is to Blame? Self-Driving Cars and Criminal Liability," Sabine Gless addresses this question and states, "Since there is no international criminal law governing robots, each national legal system will need to devise solutions based on its own general rules and principles" (Gless 415). If a robot were to cause harm to a patient in the United States, the American legal system "may be able to accommodate their models of criminal responsibility to acts of robots" (Gless 415). More specifically, the robot could only be held responsible if they have a conscience or are "free agents," but for what we know, that has not occurred yet. The penalty would then fall on the person or corporation, like a hospital, who owns the robot due to the doctrine of *respondeat superior*, which "permits the imposition of criminal liability on corporations for acts committed by their agents on behalf of the corporation, for the benefit of the corporation, or within the scope of the agent's authority" (Gless 416). Returning to our thought experiment, if a robot did hurt a patient and the robot was under the responsibility of the hospital, then the hospital would be held accountable. The accountability of robots is a risk for hospitals to take, and I fully

understand the risk is quite high; however, if robots can in fact save lives, why focus on what could happen if things went wrong? Choosing to ignore robots because something could go wrong and hurt someone is also choosing to neglect those who could be saved using robots in nursing. I am not saying that nothing bad would happen if robots were used in hospitals because I understand that there is the possibility for error to occur; however, I also understand that unpredictability is a part of life and even without the use of robots, nurses and doctors still make mistakes that can lead to death because humans are not perfect either.

What if instead of focusing on how much uncertainty there is with robots, we use them to our advantage when life throws uncertainty at us. For example, in 2020 the Covid-19 pandemic blindsided the world, and everyone lost loved ones and friends as a result. Our nurses and health care workers became our first line of defense in fighting the pandemic and that meant risking their lives. While the risk and sacrifice the nurses and healthcare workers gave to help those infected was noble and will forever be appreciated, the risk could have been reduced if robots were more commonly used in the profession. In the article “The Covid-19 Pandemic Is A Crisis That Robots Were Built For,” Matt Simon from *Wired* discusses how robots could be used to help nurses during the pandemic, and states that “autonomous robots, for instance, can roam rooms, [disinfecting surfaces with UV light](#). Or they can deliver supplies, as a robot named Tug [is already doing](#)... This could all go a long way to lightening the burden on human health care providers and helping them keep their distance from the infected” (Simon). The robots can be used to allow nurses to keep their distance as much as possible, which enables them to be more prepared for when they do have to risk their lives and encounter sick patients. As stated before, events happen that we cannot predict, but how we respond to them is what matters. If we want to live in fear and keep robots out of the nursing profession, then so be it, but if we want to take a

chance and use robots to combat the ever-changing problems that are occurring, it could end up saving the lives of patients and nurses alike.

In addition to addressing different worries that arise from this discussion, we have also looked at how robots are beneficial in the nursing profession for both children and adults, so it is only fitting that we complete the cycle and look at how robots could be beneficial to nursing with the elderly. Often in geriatric care, the nursing occurs either at an assisted living home, or in the home of the elderly person. Geriatric nursing includes many of the same tasks as other areas of nursing, such as taking vitals and monitoring the health of the patient; however, it also comes with some additional tasks. Due to the decreased ability in motor function of the elderly, nurses are often required to assist the patient with everyday tasks such as grabbing something off a shelf, opening a container of medicine, and standing up. Currently, engineers are working on creating robots that could complete these tasks for the nurses and allow the elderly to be left in the care of the robots for a short period of time, freeing up time and energy to put into more pressing tasks. In his article “A Novel Gesture Recognition System for Intelligent Interaction with a Nursing-Care Assistant Robot,” Geng Yang discusses a system that he and his associates are working on that would allow a robot to recognize a hand gesture and complete an action associated with the gesture: “To further demonstrate the practicability of the proposed system, we designed a prototype of a nursing-care assistant robot for the aged-care at home, and defined 10 special gestures to interact with the nursing-care assistant robot. The wrist band with HMT recognizes 10 hand gestures that signal the nursing care robot to act” (Yang 2). While the gestures in this study were simply to make the robot move left or right, and forward or backward, there is hope that soon engineers will develop a robot that can complete a more complex function, such as grabbing something off a shelf, in response to the movement of a hand gesture.

From there the possibilities are endless, so maybe one day the robots will be able to do the simple tasks, allowing the nurses to have some stress lifted off their shoulders. The use of robots in geriatric care will improve the efficiency of the nurses' work as well as relieve stress because they are no longer being distracted with the small, trivial tasks, and can focus on making their patients feel better.

When reading about the elderly and any form of technology, especially robots, it is completely normal to question how the two will mix. Most elderly people are not fond of new forms of technology and the idea of a robot being used to care for them could upset them. Nurses could also be a little worried about the innovations being made with robots because if robots can do all the tasks that they can, they may feel as if that is a threat to their career. To both concerns, I would say embrace the change because it is beneficial, and do not fret because the changes that are occurring will have a small impact regarding the need for nurses. In the article "How AI is Changing Nursing," Nancy Robert puts it perfectly when he answers the question of whether "nurses are destined to become obsolete" by saying, "Absolutely not; quite the opposite is occurring. Nurses are actively engaged in the creation and use of robots designed for patient care and older adult support. The robots are viewed as assistants that can help nurses at the bedside or in the community" (Robert 35). The need for nurses remains because they can provide the emotional connection that patients need, which is something that robots cannot do. In writing his article, Robert states that in discussing managing patient disease and death with Dr. Glazer, he opined, "If I'm dying, I find it hard to believe I would choose a robot over a human to help me through the event. Nuances in human behavior will keep nurses on the front line of care" (Robert 35). This statement rings true for the elderly especially because as the time of death approaches, fear sets in, and given the choice between a human and a robot, most people would choose a

human to be with them in their final moments. The emotional connection between a nurse and a patient is something that we value so much and that robots are not capable of doing, so robots should not be seen as replacements for nurses. Moving forward, robots should be used as assistants to nurses, making the lives of nurses and patients easier, but they will never be able to fulfill the place of a nurse.

There are so many benefits that could result from using robots in nursing, including saving nurses' time, making people more relaxed amid chaos, protecting nurses from a deadly pandemic, relieving stress among nurses and patients, and saving people's lives among many other benefits. While I just focused on three areas of nursing—pediatric, general, and geriatric—there are so many other areas of nursing that could possibly benefit from the application of robots. As the development of robots continues, the possibilities of what they could improve in the nursing profession are endless; however, the discussion of the development of robots should be led by nurses because they are the ones who will be assisted by the robots. It is important that the word “assisted” is clear because robots will never be able to fulfil the role of a nurse. A nurse's humanity is what makes them unique and allows them to have success with their patients. Moving forward in the discussion of whether robots should be implicated into the nursing profession, I realize that the concerns people have, like the issue of accountability and how patients will react to the robots, will not just disappear; however, it is my hope that if robots were given a chance to prove themselves, these concerns would start to fade away. Maybe one day in the future it will be completely normal to walk into a hospital and have your vitals taken by a robot, and we will think back and be amazed at how we ever got along without robots in the nursing profession.

Works Cited

Campbell, Noah. "It's 2020: Where Are All The Robots?" *Forbes*, January 14, 2020.

<https://www.forbes.com/sites/noahready-campbell/2020/01/14/its-2020-where-are-all-the-robots/?sh=18c8b5d93331>.

Frazier, Rachel, et al. "Current Trends in Robotics in Nursing Patents-A Glimpse Into Emerging Innovations." *Computers, Informatics, Nursing*, vol. 37, no. 6, Wolters Kluwer Health, Inc., 2019, pp. 290-297.

Gless, Sabine, et al. "If Robots Cause Harm, Who is to Blame? Self-Driving Cars and Criminal Liability." *New Criminal Law Review: An International and Interdisciplinary Journal*, vol. 19, no. 3, University of California Press, 2016, pp. 412-436.

Jin, Meiling, and Jeongeun Kim. "A Survey of Nurses' Need for Care Robots in Children's Hospitals: Combining Robot-Care, Game-Care, and Edu-Care." *Computers, Informatics, Nursing*, vol. 38, no. 7, Wolters Kluwer Health, Inc., 2019, pp. 349-57.

Lee, Hyeongsuk, et al. "The Purpose of Bedside Robots: Exploring the Needs of Inpatients and Healthcare Professionals." *Computers, Informatics, Nursing*, vol. 38, no. 1, Wolters Kluwer Health, Inc., 2020, pp. 8-17.

Robert, Nancy and PhD, MBA-DSS. "How artificial intelligence is changing nursing." *Nursing Management*, vol. 50, no. 9, Wolters Kluwer Health, Inc., 2019, pp. 30-39.

Simon, Matt. "The Covid-19 Pandemic Is a Crisis That Robots Were Built For." *WIRED*, March 25, 2020.

Yang, Geng et al. "A Novel Gesture Recognition System for Intelligent Interaction with a Nursing-Care Assistant Robot." *Applied sciences*, vol. 8, no. 12, Multidisciplinary Digital Publishing Institute, 2018, pp. 2349–1-19.