

**Review Article**

An Era of Future in Nursing – The Robotics

Priyanka Fernandes^{1,*}, Mani Bijlee^{2,*}¹Medical Surgical Nursing, St Martha's College of Nursing, Bangalore, India²Obstetrics and Gynecological Nursing, Sdm Institute of Nursing Sciences, Dharwad, India**Email address:**

priyankafernandes2@gmail.com (P. Fernandes), mbijlee1@gmail.com (M. Bijlee)

*Corresponding author

To cite this article:Priyanka Fernandes, Mani Bijlee. An Era of Future in Nursing – The Robotics. *Automation, Control and Intelligent Systems*.

Vol. 10, No. 2, 2022, pp. 14-16. doi: 10.11648/j.acis.20221002.11

Received: March 10, 2022; **Accepted:** April 14, 2022; **Published:** May 7, 2022

Abstract: “MAKE USE OF YOUR TIME, IT FLIES FAST”. Background: Today world is running with technology, all the other aspects of intelligence in humans which includes both personal and professional need to be considered for use of technology to ease the task in any field of work. One of the most renowned technologies that seem to be useful and challenging in nursing field is Robotic Nursing. Robots, master in artificial intelligence in field of nursing can be useful in many distinct areas like carrying out of task or may also be useful in cost reduction in hospital sector. These days world or to simply humans run short of time and this technology will become a boon for specialized patient care and it can also cut short the cost of human manpower and it becomes a double advantage to improvise our time with help of technology. Objective: Robotics in nursing is designed to help patients and hospital staffs to perform task such as assisting in activities of daily living, operating electrical appliances or bringing patient bedside according to the patients request.

Keywords: Robots, Nursing, Era, Technology, Hospital Settings

1. Nurse Robots in the World

1.1. Robot Dinsow

DINSOW, was designed by Thai and Japanese. This robot is used in hospital sector to assist in patient care, to monitor elderly patients etc [5]. Dinsow has an option even set up video chats with patient relatives. Additionally, this robot reminds patient to take their medications and exercise daily for fit living. Finally, it entertains patient by playing games and singing karaoke [5].

1.2. Robot Paro

Robot Paro is designed to adopt patients' behavior using its sensor such as light, tactile touch, posture, temperature and audio [4]. Paro is designed to look like seal and it assists to improve patient relaxation and social interaction with the care takers.

1.3. Robot Pepper

Pepper, this human robot is specialized to perform activities

related to humans [2]. It is designed to great people and assist the patients to various departments in OPD. Pepper can identify 20 different languages and can note many emotions such as anger, sadness, joy and even nonverbal gestures like smile also is a addition feature to this Robot [7].

1.4. Xenex Robot

Xenex robots is a specialized technology for disinfection and sterilization purpose in hospital setting. This robot is named because of the use of xenex gas which the technology uses to meet the purpose [9]. This technology functions by effectively damaging the cellular spores of various other bacteria and fungi and promptly delivers a sterile environment to meet the health care needs.

1.5. Robot Riba

This robot is human friendly and is specialized and designed to assist humans in their day-to-day activities. Riba helps to perform various range of motion exercises in hospital, it helps the staffs to turn the patients in the bed and also assist

the health care professionals to carry out certain interventions for well being of the patients.

2. Skills Acquired by Robots in Health Care

- 1) Robots have strategic thinking capacity;
- 2) Robots can manage financial task well;
- 3) Robots have analytical skills [1];
- 4) Robots have capacity to collaborate the task;
- 5) Robots can be set up to have innovative mind;
- 6) Robots can be improvised with business acumen;
- 7) Robots can be equipped to have leadership skills. [6]

3. Benefits of Robotics in Healthcare

Robots in health care promote high level of efficiency in patient care activities by providing safe environment to patients as well as health care personals.

3.1. High-Quality Patient Care

Robots used in medical field provide customized patient monitoring, intelligent care to assist the health care members in performing minimally invasive procedures, with the add in feature of empathy and good human interaction [3]. By this help robots will aid nurses to reduce their work load and work accordingly for the wellbeing of the patients, another specialized type of robots are known as service robots who will help the nurses in their routine task to reduce their physical demands like mobile robots will help in cleaning and disinfection where as other robots will help in maintain inventory, placing timely orders of medications [8] etc.

3.2. Safe Work Environment

Robots will also help in maintaining safe environment by providing required supplies and linens in hospital sector. Robots work with such accuracy to help in reduction of hospital acquired infection.

4. Review of Literature to Support the Robotic Nursing

A Survey was undertaken in German Nursing Care Innovation Center on Challenges and Scenarios of Robotic Assistance in Nursing Care. Data for the study was collected through explanatory sequential Survey [2]. Mixed method design was used to explore nurse's experiences with innovative technologies in everyday practice, survey items consisted of 21 polar and 10 open questions which addressed experiences with and rating of technologies that have been used by the participants in everyday nursing practice. Results of the study showed that awareness of possible robotic assistance was not widespread in the nursing community. Only 7% of respondents had experienced with robots in their nursing practice [7].

A Bibliometric Analytic study was undertaken for analyzing

Robotic technique in Nursing. Study was aimed to find the evidences and literature reviews about robotics in nursing to aid in nursing care. Tool used for data collection was bibliometric analysis of published researches which were focused on robotic care in nursing [10]. Search was done from Cumulative Index of Nursing and Allied Health Literature database [5]. 21 articles met inclusion criteria and the disciplines included were medicine, nursing, and psychiatric medicine. Study concluded that robots can be used in day-to-day activities in nursing.

A Review was conducted in Japan on Robotics in Nursing. Study was conducted to find different fields in which robots can be used in nursing [7]. Data for the study was collected from 6 electronic databases which included information from journal papers and conference proceedings. study showed that total of 1,758 articles were retrieved, from which 69 articles were included in the final review. Study concluded that chosen papers led to the categorization of robots into two main categories: assistive robots and social assistive robots [1].

5. Types of Robots

5.1. Surgical Robots

With the increasing use of technology today robots are also used to assist in some surgical interventions and those robots are known as surgical robots. This technology is designed to help the surgeons to have full control over the procedure and perform the surgeries more precisely. [9] The main advantage of these robots are the task is done with accuracy like giving incisions with minimal cuts and without damaging the other tissues, which promotes faster wound healings and aids in faster recovery of the patient [5].

5.2. Pharmacy Robots

Similarly, Pharmacy robots are well equipped to help in task in pharmaceuticals, like helping in dispensing, packing and handling with filled prescriptions. These Robots are used as hospital information tool where they collect the information from hospital information system and aid in dispensing of prescribed drugs. [3] To add on to this work these robots also help in preparation of intravenous solutions and lend a helping hand to manpower in the clinicals.

5.3. Robotics in Rehabilitation Medicine

Rehabilitation sector today is well developed in field of medicine, where robots are used to promote rehab services to patients like assisting patients to perform their activities of daily living, assisting them in range of motion exercises, promoting gait training, helping in limb mobilization and helping the patients to recover from stroke [5].

5.4. Robots in Telemedicine

Advancing technology has today driven the need that humans are being replaced by technology to perform the task by ease and researches have shown evidences that in the near future there can be shortage of health care professionals and

health care personals will be unavailable in remote areas, so today robots have come into picture to meet the demand of the public [1], where robots can assist to monitor the patients, for easy communication and camera technology is best feature of these robots where specialized care can be given to patients.

5.5. Mobile Logistics Robots

In a hospital setting, all the equipment's should be transported on daily basis such as medication orders, trash, melas and linen or laundry items [3]. So mobile logistic robots can help in performing these task and can reduce the waiting time and work of staffs. These technology robots are fixed with specific sensors to navigate across the hospital environment to help out the patients and thus directly or indirectly promote good patient care [9].

6. Can Robots Replace Nurses

Here the answer is NO..... Because without humanistic skill machinery gadgets won't work to reinforce the quality of care. To make use of modern technologies human coordination is must. Likewise for robotic surgery humans are the one who are handling the gadgets for surgery. The usage of robots reducing our time required to complete the task, increasing flexibility of care, and assisting in day to day basis to improvise the care given in the medical field. On the other hand robots are build up to perform task as per the need, but human are skilled to perform all the task which requires both man power and emotions, so robots can be replaced by robots and humans can be replaced by humans.

7. Robotic Technology a Boon or Bane

Today robots are both constructive and destructive in the field of health care, it all depends on the way humans make use of technology, as discussed earlier robots are made of artificial intelligence and Humans are the master minds to use this technology for benefits or loss. If robotic technology is used for good purpose then it saves lot of time where time is a constrain to perform task in health care and thus promotes specialized care to patients in need, similarly if the technology is used for destructive purpose then it becomes a bane to the society where the ultimate victims will be innocent humans who are in the need of care.

8. Conclusion

Today technology is wide spread in the world and emerging

trends to be accepted by all professionals. Robotics is today a boon to lend the helping hands to care for the patients in an efficient way. Being aware of robotics and adopting necessary changes accordingly can aid in best prognosis of the patients and directly or indirectly giving the best outcome in our health care.

References

- [1] Noel Maalouf, Abbas Sidaoui, 2018, Robotics in Nursing: A Scoping Review from Robotics in Nursing: A Scoping Review - PubMed (nih.gov).
- [2] MARI TIETZE & SUSAN MCBRIDE, 2020, ROBOTICS AND THE IMPACT ON NURSING PRACTICE from robotics-and-the-impact-on-nursing-practice_print_12-2-2020-pdf-1.pdf (nursingworld.org).
- [3] Costantino Grasso, 2018, Challenges and advantages of robotic nursing care: a social and ethical analysis – THE CORPORATE SOCIAL RESPONSIBILITY AND BUSINESS ETHICS BLOG from Challenges and advantages of robotic nursing care: a social and ethical analysis – THE CORPORATE SOCIAL RESPONSIBILITY AND BUSINESS ETHICS BLOG (corporatesocialresponsibilityblog.com).
- [4] Robots in hospitals, 2015, from <http://www.nelmia.com/content/robots-hospitals>
- [5] 2002, Health care administration degree programmes from How are Robots Changing Healthcare? - Healthcare Administration Degree Programs (healthcare-administration-degree.net).
- [6] V. Indra, S. Urmela, 2018, Impact of Information and Communication Technologies in Nursing Care. Int. J. Nur. Edu. And Research from International Journal of Nursing Education and Research (ijneronline.com).
- [7] Costantino grasso, 2021 challenges in robotic nursing care from <https://corporatesocialresponsibilityblog.com/2018/06/26/robotic-nursing-care/>
- [8] Akshyakumar S. Puttevar, A. S. Chatpalliwar, 2013, An overview of Ant Colony Optimization (ACO) for Multiple-Robot Task allocation (MRTA). Research J. Engineering and Tech from Research Journal of Engineering and Technology (ijersonline.org).
- [9] Managing the Future of Healthcare: How Robot Nurses and AI Will Shift Healthcare (maryville.edu) from Managing the Future of Healthcare: How Robot Nurses and AI Will Shift Healthcare (maryville.edu).
- [10] Joseph Andrew pipito, 2018, Can Robots Replace Nurses 3 Predictions from Can nurses remain relevant in a technologically advanced future? - PubMed (nih.gov) HCI College.