**IMPACT OF ROBOTIC IN HEALTHCARE**

**BY**

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**ABSTRACT**

*This seminar paper is aimed at analyzing the impacts of Robots in the Health sector. The virtual and mechanical robots have assisted people in a variety of tasks within and outside the laboratory and operating rooms. Some examples of robot intervention include medication administration, assisting children with autism, telemedicine, and transferring/lifting patients. Although robots have made many activities easier to handle, there have been various consequences associated with utilizing such technology which has impacted ethical policy and pharmacist staffing.*

**INTRODUCTION**

Robots are vitual or machine objects that are used in facilitating the occurrence of multiple everyday activities. They have been heavily depended upon in U.S. industry, since 1961, and in health care after the mid 1980’s. The virtual and mechanical robots have assisted people in a variety of tasks within and outside the laboratory and operating rooms. Some examples of robot intervention include medication administration, assisting children with autism, telemedicine, and transferring/lifting patients. Although robots have made many activities easier to handle, there have been various consequences associated with utilizing such technology which has impacted ethical policy and pharmacist staffing (Gardner, 2012).

**HISTRORY OF ROBOT IN AUTISTIC CHILDREN**

During the 1990s, the Roball robot was invented to assist in a child development through providing autistic children with stimulation and interaction experiences. Its spherical ball, which encases sensor and processing elements, would allow the robot to navigate obstacles, would allow the robot to navigate obstacle in playroom environments for 60 seconds. Afterwards, the robot would request to be spun, shaken, or pushed in order to move again, and indicate whether it feels dizzy or wants another spin. (Michuad, 2007) If the child appropriately responds to Roball's request (e.g. spinning Roball after Roball has asked to be spun), the robot says thankyou. According to Michaud (2007), children become more compliant with robots that look and move like people who repeat themselves. Thus, the Roball has been replaced with humanoid robots to help children with autism grow in social skills.

Humanoid robots engage in child's play through moving its facial structures to create facial expressions (i.e. winking; smiling; frowning) and conducting imitation exercises. Robot a robots are a specific type of humanoid robot that can be taught to dance, utter simple vocabulary words, and put on clothes through the child's teaching via sound and sensory movement (Billard, Robins, Nadel, & Dautenhahn, 2006). Although the Aurora project, which examines how autistic children interact with humanoid robots, is still ongoing, the child's learning outcome from using Robot a technology would be to discriminate their own movements as a result from Robota's motions (Billard et al., 2006). The child may also be able to distinguish between perceptions resulting from their own actions from perceptions caused by another's actions.

**ROBOT TECHNOLOGY IN TELEHEALTH**

Certain ethical considerations are consequence of robot technology applied to elderly care. For instance, it older adults or family members were to provide care using robots such as computers, and video and audio conferences, learning how to operate these devices may prove to be a challenge since elder adult caregivers can have little computer experience and / or possess vision and hearing impairment. In telemedicine, where telehealth robots such as recording and monitors show patient medical procedures and discussions, preserving patient confidentiality has been another ethical issue since video and audio recordings are transmitted via telephone lines, satellite, and technical staff at the clinical site, and can be viewed by other patients with the same condition or support groups (Demiris, Doorenbos, &. Towle, 2009). Often patients unfamiliar with how their recordings are transmitted over great distances may feel their privacy violated during videoconferencing sessions. Tele-support group facilitators would need to assure maintenance of patient confidentiality through standard encryption, security protocols, and non-recordings during support group meetings (Demiris et al., 2009). Tolow-income rural and urban adults, computer and/or Internet access may be restricted to where Telehealth would cost more than benefit.

Thus, if computers were widely accessible through economic status and community facilities (i.e. high income; public library) to American, Indian and Alaskan Native elderly populations, going distance for telesupport would not be needed (Demiris et al, 2009). The lack of therapeutic touch with robotics (i.e. video monitors and recordings) would also present an ethical concern with patients since touch is considered one of the most effective and frequently used interventions in clinical care. Although health staff would have to consider the value of touch and direct communication differing with each patient, Gardner (2012), stated that universally among health care, "physical closeness is considered as an embodiment of caring in clinical care". As a usual result, therapeutic touch such as holding someone's hand can instinctively cue how someone feels while allowing trust to be established more easily with a physician or nurse, compared to a video monitor or indirect communication medium that may possibly leave both wondering whether trust exists (Butter, 2008). However, face-to-face interactions through a video monitor can still be as effective with patients if practitioners demonstrate significant adroitness in their interaction through the medium (Gardner, 2012). Since it is essential for health care providers to sense how their interaction is affecting their patient, the ability to read another's body movements would be grossly different when being physically near someone without robotic.

**ROBOTS AS PATIENT LIFTS AND TRANSPORTERS**

In addition to providing hands-on patient care, robots have also served as mentors and lifts for patients of various ages. Japanese inventors created the "Robot for Interactive Body Assistance" to transport patients weighing a maximum of 134 jbs to bedsides and wheelchairs using built-in sensors and foam support technology (Demiris et al, 2009).

**ROBOTICS IN PHARMACY**

A robots predictability can have its benefits on medication administration. Since the new millennium, health care staff has had to increase their service hours within impatient and outpatient care. As a result of increased hours along with prescriptions, a prescription-filling robot has been utilized in more than one thousand pharmacies for the 2007 alone (Lin, Huang, Punches, & Chen, 2007). The device’s robotic arm will attain the appropriate vial, in addition to scanning and using bar codes to verify medication,; these robots also package, store, and dispense filled prescriptions to patients (Butter, 2008). Before the installation of script SP-200, an automation prescription and technicians were spending 0.56 more minutes in completing direct and indirect prescription (Lin et al, 2007).

Although expense to implement robot technologies in medical facilities can be unaffordable for patients, inventors and researchers continue to pursue enhanced robot technology for health care. According to eHealth’s Robotics for Health care: final report (2008), increasing a robot’s intelligence for tele-diagnostic and patient monitoring devices have been considered for further investigation (Butter, 2008). The invention of intelligent tele-diagnostic and patient monitoring robot system would be anticipated for lessening a nurse’s and physician’s task through the robot being to consult with patients, report incidents, and monitor patient vital signs (Butter, 2008).

According to Butter (2008), other benefits of using robots in healthcare are given below.

Benefits of Robotic Surgery

Robotic surgery offers many benefits to patients compared to open surgery, including:

1. Shorter hospitalization
2. Reduced pain and discomfort
3. Faster recovery time and return to normal activities
4. Smaller incisions, resulting in reduced risk of infection
5. Reduced blood loss and transfusions
6. Minimal scarring

**Advantages**

Major advantages for surgeons using robotic surgery include:

1. Greater visualization
2. Enhanced dexterity
3. Greater precision

Robotic surgery is an advanced form of minimally invasive or laparoscopic (small incision) surgery where surgeons use a computer-controlled robot to assist them in certain surgical procedures. The robot’s “hands” have a high degree of dexterity, allowing surgeons the ability to operate in very tight spaces in the body that would otherwise only be accessible through open (long incision) surgery.

Compared to open surgery (traditional surgery with incisions), robotic and minimally invasive surgery results in smaller incisions resulting in less pain and scarring.  
Robotic surgery allows surgeons to perform complex surgical tasks through tiny incisions using robotic technology. Surgical robots are self-powered, computer-controlled devices that can be programmed to aid in the positioning and manipulation of surgical instruments. This provides surgeons with better accuracy, flexibility and control.

When performing robotic surgery using the da Vinci Surgical System:

1. The surgeon works from a computer console in the operating room, controlling miniaturized instruments mounted on three robotic arms to make tiny incisions in the patient.
2. The surgeon looks through a 3-D camera attached to a fourth robotic arm, which magnifies the surgical site.
3. The surgeon’s hand, wrist and finger movements are transmitted through the computer console to the instruments attached to the robot’s arms. The mimicked movements have the same range of motion as the surgeon allowing maximum control.
4. The surgical team supervises the robot at the patient’s bedside.

**CONCLUSION**

In many ways, robots have assisted patients and health vocations in the medical field. Although ethical concerns lie with technological affordability, ability to assure patients of their privacy protection, and assuring patients that less therapeutic human touch is acceptable from health benefits for both patients and staff seem to outweigh the ethical cons of using robot technology. In regards to future automation interventions, robot-managed surgery, patient monitoring, motor coordination analysis, and mental, cognitive, and social therapies are being further investigated in Europe. However, it may take 25 more years for any new technology to enter health care.

**RECOMMENDATIONS**

The use of robots should be employed in the treatment of patients even in Nigeria clinic to avoid complications resulting to the death of the patient.

Also, robots will serve as the best technology in taking care of Corona virus patients to avoid the health care giver being contacted with the virus.

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