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MONOGRAPH:

**“IMPLEMENTATION OF 3D PRINTER IN MEDICAL PROCESSES IN THE UNITED
STATES SINCE THE LAST 20 YEARS”**

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Gratitude

I thank God mainly for giving me the knowledge and desire to carry out this theme. To my parents, Ana Maria and Jorge, who support me every day, so that I can meet my future goals and who have instilled in me to be a capable and independent person with values such as respect and perseverance. To my teachers who have guided me in the best way to do a good job, giving me advice and support in the course of my monograph, and finally I want to thank everybody who helped me through the process of the analytics of my work and research.

Summary

The author of this monograph has chosen this topic because she wanted to analyze the social impact of 3D printers in medical processes and whether this type of tool could be used as a means to save thousands of lives around the world, for its ability to create a number of devices, not for domestic use, if not use at the level of health. She started looking for the origin of the 3D printer in this part focuses on how they have evolved over time, and how they work within medical processes.

The 3D printers in the processes are not widely used in our country for the manufacture of organs, tissues or cells through this printer that by the creation of these objects would be called bioprints because they are composed of biomaterials and cells so at the time of implementation of this is not rejected within the human body.

It gives us a definition of what biomaterials are and gives us an example of this, explaining where the biomaterial comes from, as well as the contemporary impact that bioprinting has had within medicine, since not much is known about the use of biomaterials in the use or medical processes, not to mention their functions within the human body, as well as the pros and cons involved in the use of this printer.

To conclude this monograph, the author concludes with the social impact that bioprinting has had on the lives of people and society, bioethics its concept, where it comes from and why it goes hand in hand with the 3D printer, cases of bioethics in everyday life as in some emergency where a person is in a serious state of health and after everything that has happened, wonders why the 3D printer in medical processes would improve the lives of human beings, which would be the benefit of this machine for our health.

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Introduction

The present investigation on the implantation of **The 3D printer in the medical processes in the United States since the last 20 years** was based on the 3D printer in the medical processes and that many people know the 3D printer as a technological device in which only they can create objects that are only used for home decoration such as home, dolls, shoes, accessories if they think that a 3D printer can generate some material or any type of object that is used for domestic use, unless saving a life by creating an organ that generates the 3D printer these printers are called bioprinters thanks to the biomaterials with which it creates any part of the body from large to small as a bone to as small as a tissue or cell.

The creation of this research is to make people aware of ways to save lives and not illegally, since today there are people who traffic with organs or for people who urgently need an organ and cannot get it because the list of Waiting for organ transplantation is very long. A concrete example of this is how in Europe they had 88,000 on the waiting list for a transplant in 2018 and only 1,600 received this transplant, in addition to this over the years the rate of increase is increasing. people who need an organ and if the demand for it is very large, the importance of these procedures so that people can get an idea of how this procedure can help many people and understand bioethics and why they need to learn from it, Many people are afraid of this because they think it is something new for society that in itself are not accustomed to these tools but also to the usual ones.

Every day more electronic devices are created or the device is modernized if over the years the printer is modernized or a printer with a different utility is created (including the famous ink printer and others such as the bioprinter, the multifunction printer, the laser printer, impact printer and 3D printer among the most valued) and these increase their price according to the new features that are modernized. Bioprinting is conceived from the combination of science, biomaterial recognition and 3D printing. In addition, it depends on the coordination of several

advances in fields, for example, construction, atomic science, materials science and prescription. There are extraordinary results conceivable to update this assembly method, as it is added to reduce expenses and improve the need to accelerate procedures to exploit its focal points.

The 3D printer emerged from this idea and process 4 decades ago, but it is clear that the inventors of this device system knew that they could change the economy and the way of life of people in the not too distant future, the emergence of this application It has been transcendental in everyday life and has served as a better quality of life for human beings, there are still many extraordinary things that specialists and researchers will find later, however, society and some specialists are sure that 3D bioprinting It may be one of the best medicinal advances we find in our lives. A true transformation for the final destination of the medication.

Chapter I

3D Printing

1.1 History

Today, most people believe that the invention of 3D printing is a technology recently created about 10 years ago, but in reality the 3D printer has a period of history more than 4 decades after the invention of the inkjet printer, this invention was the future project, the 3d printer.

The first beginnings of the creation of the 3d printer was in 1980 until 1981 when the Japanese Dr. Hideo Kodama of the municipal industrial research institute of Nagoya Japan, applied for a patent for a prototyped, rapid photo polymer system. This photopolymer material system has a UV light that powers the parts and builds the model in layers, but due to financing problems, the full specification of the patent is not completed within one year of application.

In 1984 the stereolithography was invented by Charles Hull, Fishertechnik (2011) affirms: “The first attempts with 3D printers began in 1980. The North American Charles "Chuck" Hull is considered the inventor of this process called "stereolithography", which consists of hardening a liquid material sensitive to light by means of a UV laser” (p.35). The purpose of the stereography was to create solid objects by means of a material curable by ultra violet light that, on contact with the liquid photopolymer, the photopolymer is polymerized and changes from a liquid state to a solid state, solidifying mask by mask, in order to create a three-dimensional figure and in 1986 this invention is patented and Charles Hull creates the company 3D Systems in Valencia California.

After having been created the company 3D Systems in 1987 Carl Deckard creates the selective sintering by laser (SLS), that serves to create prototypes and lasting functional pieces, this allows to print of independent way movable pieces in an only construction, in the selective sintering thermoplastic powders are used which allows that the matter when forming becomes flexible.

The process of selective laser sintering is in which a CO2 laser selectively melts the preheated plastic powder, a bucket of powder descends a distance equivalent to the thickness of the formed layer and a new layer of base material is added to the surface. The process is repeated as many times as layers need to be melted to create the three-dimensional object (INTI, 2009, p.36). When this process is finished, it is removed and subjected to a cooling phase where the whole set, named with the pieces included, and the finish is sandblasted to eliminate all the dust, leaving a global and homogeneous texture.

At the end of 1987, in 1988 the invention of the molded by fused deposition (FDM) by Scott Crump appears, for the simple fact that he wanted to generate a toy for his daughter and that led him to manufacture it in his own house with the candle wax materials with polyethylene and using a hot glue gun, he realized that he could create a three-dimensional object, After this enhanced experiment he began to make more of these in his own home until he turned his passion into his work and realized that if that hot glue gun was connected to a Cartesian robotic system, the modeling process could be done automatically and that is how molten deposition molding was born.

Which the process of this machine was, a plastic or metallic filament is introduced in a nozzle that has a resistance that emits heat until arriving above the temperature of fusion of the material. It also has a mechanism to control the flow of this material (Bordignon, 2018, p.37).

In 1989 the FDM is patented and Stratasys is founded, 1992 Stratasys sells its first product which was 3D modeler, after this invention, this was what generated that this method has a greater diffusion lowering costs and allowing to small users and to non-industrial workshops, to have access to this technology for own purposes.

In 1993 MIT created the 3D binder injection printer, Jim Bretl and Tim Anderson designed this by hacking into an old inkjet printer in which an inkjet head that moves through a bed of dust and selectively sediments a liquid binder component, This printer was the first to be able to print

objects in full color, after its patent in 1993 in 1995 create the company called Z Corporation to which was titled in a privileged way the 3D printing technology of the MIT.

In 2005 the 3D printer caught everyone's attention as the RepRap project was carried out which is Replicating-Rapid prototyper and was funded by Dr Adrian Boyer, this project started as an initiative for students to create a 3d fused deposition molded printer at a very low cost, it can print most of its components, in 2006 a prototype of it is created and it is possible to print the first part of itself and in 2008 the first printer created called darwin, achievement more than half of the total of its parts, the progress of the RepRap is given grace to that has Hardware and free software, which allowed millions of collaborators around the world to develop and improve the technology.

After this the 3D printer was recognized and exploited to the world and in 2010 began to improve the technology of the printer not only to create objects of daily life, which we use only for cooking or objects for decoration or scores for cars, but that cars were developed with its entire frame and a regenerative medicine company called Organovo took the 3D printer as a method of printing and creating organs, blood vessels, etc..., by means of biomaterials what generates that an organ, glass, etc..., can form part with the time inside the organism making that organ work.

The technological progress in 3D printers will improve the high speed and mass of matter, over the years, their production for the producer's desktop printer on the kitchen table or anywhere at present not all products are candidates for customization and therefore for 3D printing. While it is not difficult to imagine that quite a few people would like to print their own clothes, medicines, accessories, furniture or food, it is more difficult to expect that many people also want custom versions of garbage bags or closures and have them made.

Therefore, in general terms, we can assume that consumers who prefer personalized products, and who are willing to pay for them, will print at home. Others will prefer standardized

products. Bordinon (2018) states: "These will be done by traditional machines or professional 3D printers once they can compete with the economies of scale of traditional mass production methods" (p.47).

1.1.1 Use.

Production companies currently use 3D printing at all stages of production, from product development to after-sales service. According to the 2017 annual report on 3D by Wohlers Associates, which is a consulting firm specializing in 3D technology analysis.

A third of the 3D printing time is used to produce "functional parts". The sixth part of the time is used for the "fitting and assembly" of physically large products and the sixth case is used to make "models for prototypes of metal casting tools". Leering (2017) states:

3D printing technique could be applied to many more products. Far from all manufacturing industries have experience with this production technique. Industrial machinery, automotive, aerospace, medical and dental devices, and consumer products (electronics, etc.) are the five industries that have been using 3D printing. (p.5)

1.1.2 Procedure.

All 3D printers do not use the same technology. There are numerous means to print the layers so as to form the finish product. Some techniques liquefy the material or simply soften it to make the layers whereas others uses high powered UV laser to cure photoreactive resin and "print" the object.

Some of the 3D printing technologies that are most broadly utilized these days are:

- 1) Stereolithography (SLA)**
- 2) Fused deposition modelling (FDM)**
- 3) Selective Laser Sintering (SLS)**
- 4) Laminated object manufacturing (LOM)**
- 5) Digital Light Processing (DLP)**

The very first step to 3D print an object is to make a model of the object using CAD software. The model describes the geometrical properties of the object. The CAD file is then converted to STL file format. This file format defines the external closed surfaces of the original CAD model. The STL file also includes the data for each single layer and can make calculations for the layers. The STL file is sent to the 3D printer and the printer is setup before build process, where settings include build parameters, like energy source, layer thickness, etc. The part is then printed by an automated process without any supervision. When printing is done, the printed part is removed and sent for post processing. After that, the object is ready for application. Since there are different 3D printing technologies, the type to be used depends mostly on the kind of object to be made. Each of them has its claimed benefits and downsides. The next section explains each of the different processes in detail and gives examples of products that can be produced by each of them.

A. Stereolithography

Stereolithography (SLA) is recognized as the original 3D printing process. SLA is used mostly to create models, prototypes and patterns. Being a laser-based process; it uses ultraviolet laser and a vat of resin to build parts. The laser beam marks the design onto the surface of the liquid polymer. Exposure to the ultraviolet laser causes the chains of atoms in the polymer gum to connect together. As the photopolymer resins react to the laser, it forms a solid part in a very precise way.

B. Fused Deposition Modelling

Another technique of 3D printing technique is the Fused Deposition Modelling (FDM). This process is also used for making models as well as prototyping. 3D printers that run on this technology build a part layer by layer, from the bottom to the top by heating and extruding thermoplastic filament according to the 3D data supplied to the printer. Each layer solidifies as it is put down and it bonds to the former layer.

C. Selective Laser Sintering

Another technology used by today's 3D printer is the Selective Laser Sintering (SLS). During this process, tiny particles of plastic, ceramics or glass are joined by heat from a high-powered laser beam to form a solid.

D. Laminated Object Manufacturing

In the method of Laminated Object Manufacturing (LOM), sheets of plastic or plastic materials are laminated or fused together by high temperature and pressure and then shaped to the required form with a computer-controlled laser or blade.

E. Digital Light Processing

Another technology used by 3D printers is the Digital Light Processing (DLP). DLP is a similar process to Stereolithography. The main dissimilarity between these two methods is the light source. SLA uses a laser whereas DLP makes use of conventional light sources to cure photosensitive polymer resin.

Chapter II

Biomaterials

2.1 Definition and examples

To begin to address the issue of biomaterials, we must first bear in mind that it is a material and because it is important to our lives. If a material is an element that is introduced as an ingredient in some composition, everything we know as palpable objects, are composed of materials from the smallest sharpener to the largest building in the world, if we look at the history of this we can see that from the beginning of time human beings develop materials according to their need or use.

The evolution of the material was with form was passing the time, first it was in the age of stone, with the lances constructed for the house and the bones of the animals that hunted they used them like tools also, later when entering the age of the metals we can see how the materials are changing and now instead of being of rocks and bones, they construct weapons from the metal and generated alloys with the bronze and the copper. After this a material formed by synthetic materials by organic compounds is created that we know as the plastic in 1860. At present materials are created based on polymers, chemical compounds and other bases of materials and from here the biomaterial is born.

The biomaterial in definition are all those substances of natural and synthetic origin, used in prosthetic, diagnostic, storage or therapeutic applications and that do not adversely affect living organisms and their components, basically biomaterials serve to restore or alleviate the office of a damaged tissue, damaged organs, promote healing or regeneration of skin as sutures, gives us the help to generate aesthetic processes such as dentistry and help the treatment where catheters and probes are used.

At present biomaterials allow us to have a long and lasting life, if we come to suffer from any disease, gives us an enormous opportunity because when we come to need an organ, tissue or

blood vessel there would be no rejection of this biomaterial since these are made on different bases with cells of the same patient and this leads to no immune rejection in the body which is the most fundamental difficulty with transplants today. If we can analyze it from this point of view, we can see that in biological terms it is better and natural to have a heart created through a 3D printer with biomaterials that contain your own cells than to have a transplant from someone else's body.

There are four major groups of biomaterials today that are used in most biomedical devices, these groups are made up of metals, polymers, ceramics and composite materials. The first group are metals, if a metal is made up of metals and can include other materials such as carbon and alloys such as chromium and cobalt to use these metals are required to be tolerable for living organisms as it is essential for the dose they can provide for living organisms and have good resistance, these are mainly used in hip prostheses, knee, dental implants and screws and bone fixations.

The second group are polymers which are organic macromolecules composed of the union of smaller molecules that are called monomers and here we find silicone, nylon and polyethylene, these are intended for the manufacture of sutures, vascular or ear implants.

One of their advantages is that they can be provided with a wide variety of properties through the introduction of chemical additives, macromolecules or second phases. Shape, structure, texture, rigidity and flexibility are properties that a priori can determine their use. (Lizarbe, 2007, p.9)

After this the third group are ceramics such as alumina used in dental implants and orthopedic prostheses, these are derived from calcium phosphates for use in bone fillings and the last and fourth family are compounds which contain different stages of chemical nature, are themselves carbon-based materials, up to those reinforced with fibers and have been applied in complex devices such as heart valves and implants in joints.

An example of Biomaterials in the process or medical use in the 3D printer is in the manufacture of a kidney for a young man named Luke, who was about to be hospitalized and dialyzed because his kidney itself was already failing in 2003, Luke was born with a spina bifida which is a birth defect in which a baby's spinal cord does not grow properly at birth and his kidneys and bladder did not function, went through about 16 surgeries and seemed impossible to do while he had a kidney failure when he was 10 and this surgery that implemented an organ printed with biomaterials and his own cells saved his life.

2.2 Impact in contemporary medicine

The 3D printer in medical processes goes hand in hand with biomaterials, currently has a big impact on humans because it gives them a better quality of life, without coming to see any problems in the future. printing or added substance fabricating for prototyping, making molds, instruments and for customization or customization of segments. Numerous organizations that offer 3D printing administrations to industry, one of the principle upsets in the field of wellbeing connected to 3D printing is the assembling of biomodels that are utilized to test the careful mediation, likewise fabricated by 3D printing careful aides, with cutting focuses. A sort of formats for the specialist to be guided during the activity.

3D printing is additionally being utilized in patients with craniofacial distortions, oncological deformations of the skull and face or maxillofacial reconstructions (Rodal, 2019). Another case of the utilization of 3D printers in the field of wellbeing is the production of tweaked inserts. Numerous organizations have even been offering 3D printing administrations for dental pieces for as long as couple of years.

A couple of years back, the production of automated hands utilizing 3D printing was likewise very fruitful. These hands are made out of various plastic pieces reenacting the distinctive phalanges and metacarpal bones and are joined by a sort of strings of safe material that give them some portability and grasp conceivable outcomes.

2.2.1 Pros and cons.

The 3D printing is one of the cutting-edge advances that made Charles Hull of the United States of an incredible joining and impact that is as of now used to mean the vision of imaginative choices in drug to make life useful for each individual: nanotechnology, biotechnology, data and correspondence innovations, apply autonomy and man-made reasoning.

The advantages of 3D printing we can say that there are five, which are the most important volubility which we can see is the hand invoice of making an indefinite number of products, other advantage is that it is permissible what it means is that there is no limit of imagination for the things that can be created, reducing costs because the object or matter you want to create is made from home, can generate multiple uses as in medicine in the creation of prostheses, tissue medicines and can also be customized as one can create their own products, accessories and so on.

The disadvantages of this are that it abuses copyright. The reproduction of items with copyright will be hard to control since 3D scanners permit the imitation of any article, the vindictive use as guns and the threat of summing up this sort of articles and the expansion of futile items. “The reproduction of items with copyright will be hard to control since 3D scanners permit the imitation of any article, the vindictive use as guns and the threat of summing up this sort of articles and the expansion of futile” (Lopez, 2016, p.13).

Chapter III

Social impact of bio printing

3.1 Social impact of bio printing

In the world there is much controversy in bio printing and the ethics of this, for the quality of bio printing and biomaterials, for copyright or counterfeiting of bio prints, the bio printer in whether it is a resource or a machine, which with the proper use or procedure can come to create wonders for the human being and for his own good. But let's put ourselves in the role where this bio-printer becomes common in society and anyone can easily obtain it, which is what would happen with it and its use, if these become common in use, like ink printers or printers that create materials for decorations etc... and begin to create tissues, globules or organs for private use, there would be a disorder of the quality of that product created, because there would be no one from any corporation to audit this bio impression and for this reason the life of this person who created a bio impression by himself who does not have a management knowledge of professional management or use, nor the appropriate health area could be at risk of losing his life.

This figure is still argued, to generate rules to regulate this difficulty, a preference to prevent these situations happen is only to authorize the sale and purchase of official corporations of development and research, also over the years it will become impossible to administer the manufacture of the replica of the bio printers by some official corporation of the development of science, another preference, even though there may be danger of smuggling, is to limit the sale of organs and prostheses to only corporations that are legally registered in the area of health and the last presence of this to discuss is the piracy of these bio prints and by this one has to regulate the copyright either of tissues, cartilage or cells, apart from this, It is good that plans or ideas of these creations of bio impression can be shared because they generate creativity and ingenuity so that people in the future can create artifacts that serve to improve their lifestyles, until today the

only ones that have the bioimpressors are only the large research corporations and some health centers, so until today there is no risk of piracy.

3.1.1 Bioethics within bio printing.

In order to introduce ourselves into bioethics, the first thing we need to be clear about is the difference between ethics and morality. When we refer to morality, be it that of a people or that of a society, it is a set of customs and values that are freely accepted by all the people who constitute that society and whose objective is to achieve coexistence.

The morality of a given people is a set of customs transmitted from generation to generation and that are freely accepted (Clark, 1994). This tells me what is right and what is wrong to do, an example of this would be the ten commandments because, if we get to look at this strictly not for religious value, we can find a group of orders that the Hebrew people in the eighth century before Christ considered as an individual and personal way of behaving in a good way, what was good? They were a list of those things that that community thought allowed them to live with each other.

As the years go by the customs of the people can change with time the most classic example is that of slavery has existed until 1813, today it is considered that making people work as if they were slaves, is something very bad and undesirable and in others slavery was accepted as one of the conditions of coexistence in society.

The ethics when we speak of ethics in the sense that it is not the habitual or daily language, we can say that it is that science or part of the philosophy that studies the moral, it is a science that examines the human attitude and is able to define it, to recognize it, to study the different theories, the concepts of our moral responsibility, the different theories of different thinkers who have been developing over time, to what things we consider good and what things we consider bad, then when we say that ethics itself is the science that studies morality is very important to know that in everyday language or when we read the word moral and ethics. In a text we find

that the meaning is exactly the same, since for everyday life ethics and morals are the same and are related to those things that our community considers to be good.

The ethics of the physician means the relationship of the physician with the patient, with his being sick, with his suffering and his environment, with fellow physicians, with representatives of the profession, with medicine in theory and praxis and state. (Meyer, 2004, p.16)

So then when we say that a person has no ethical behavior or is immoral, we are saying that his behavior is against what we consider as good and desirable, for everyday language ethics and morality is the same, but if we speak of academic language we return to what we spoke earlier that ethics is the science that studies morality and morality is the set of customs that guides the individual and social behavior of men.

In order to emphasize ourselves within bioethics it is important to point out a concept that is related to the moral life of the people who work in the health professions and for this, we have to know the concept of deontology, the concept of deontology. Deontology is a science and what it deals with is the professional duties of a nurse, doctor, quineceologo or any person who is involved in the area of health and what they want to show us is the science that deals with the professional duties of the members of the health team and acts through rules and laws mandatory for the right to act.

This is a very ancient science and we can say that the first code of ethics in medicine is the Hippocratic oath, where a series of rules were given, some of which have remained for the moral life of all physicians of all ages, such as the keeping of co-officially and these rules demonstrate that rules are considered good when a doctor or is in procedure to perform any procedure performed on the health of any patient.

If we want to know from where bioethics is born, we must put ourselves in the middle of the twentieth century, where new inventions and creations for the use of medicine begin to be born, such as artificial respirators, devices for kidney dialysis, the creations of the 3D printer and the

uses given to them within medicine such as the creations of organs, tissues and prostheses, all these new techniques bring to medicine a series of ethical problems, problems in which exactly we do not know clearly how to act or solve and this is where we ask ourselves, if it is correct that one produces human embryos outside the womb and against what nature had already decided, if it is correct that a person already see with agony or with a harmful oncological disease, a doctor continues to keep her alive because he simply has the devices to perform it, it is correct to put at risk the lives of people to obtain knowledge, on the risks of how to start administering medications, all these series of discussions that are related to the advancement of medicine or medical science with recent technologies tried to get their conclusion from bioethics.

In the 70's Walton Bright wrote the definition of bioethics considered as the systematic analysis of human behavior in the area of life sciences and health, examining the values and moral principles, in if it studies the behavior of man and his behavior from close up, this aims to bring on the one hand this knowledge to the use of some specific cases in certain circumstances, in certain patients and on the other hand it is to define principles and rules that in the future can be validated by legal regulations or regulations in different circumstances.

An example of this situation is confidentiality and autonomy or respect for autonomy, in the principles of bioethics it is said that it is very important that the doctor respects the wishes and autonomy of the patient and that he does not act as if he were the father of the patient or as if everything that a person can decide about his health, This has generated a series of principles of bioethics, these principles were designed by two thinkers called Tom Beauchamp and James Childress, these two North American philosophers what they did was to define which are the principles that we have to use in the case in which we have an ethical dilemma.

A classic ethical dilemma is a case of Jehovah witnesses, what happens in this situation is that if a patient arrives who had a car accident, who has excessive blood loss, an intra-abdominal

hemorrhage and a blood transfusion is needed and relatives tell the doctor that although the boy may die the doctor cannot generate this blood transfusion because religion prevents the Jehovah witness receive transfused blood, here in this situation a dilemma is generated since the doctor has the obligation to help and to maintain the health of a person, but on the other hand they are warning the doctor that this person does not want to be helped because what he lives as a deep and important principle, is that the technique that precisely the doctor wants to apply is not good for the patient, speaking of this problem that is divided into two parts are made the principles of bioethics that help to solve this dilemma.

The principles that the North American bioethics are those of autonomy, beneficence, not maleficence and justice, these four principles are used when the doctor comes to have bioethical cases, in the principle of autonomy in what is based is that the doctor or people of health have to respect the desires of the patient, in the beneficence has the obligation to do the good to the patient, The principle of non-maleficence is based on using all those procedures as long as they do not harm the patient and the principle of justice is related to equity which means that all the distribution of resources that are always scarce are distributed equitably in such a way that those who need it most have flexible access to them.

These four principles put into play for situations in which they can help the doctor, as in the case of the witness of Jehovah , where what the patient needs is a transfusion of blood that the doctor needs to save the life of this , we can call this as a principle of beneficence , but as the witness of Jehovah would refuse to do so under his will the doctor would be acting under the principles of autonomy and here the doctor has to think about which of these two dilemmas will be at stake whether it is autonomy or beneficence to resolve this dilemma. In addition to these four principles, there are the three bioethical rules that are confidentiality, truthfulness and informed consent are part of the clearest concepts, classics and important that doctors can consider and know of a discipline that is called bioethics.

These bioethics in the area of bio-printing, whether as cartilage that is most prevalent, from stem cells, bones, tissues to organs. The ethical and moral situations that encompass the impression of this, address a chain of ethical issues by how these technologies are developed and used to improve the quality of life of the human being, in addition they propose three ethical points which are, the justice of medical care, the justification of safety and efficacy and if use will be to improve the lives of patients beyond the common. “Humankind urgently needs wisdom as a guide for action, a knowledge of how to use knowledge for the good and future of the human condition (...) which has the fundamental requirement of promoting quality of life” (Ciccone, 2006, p.15).

3.1.1.1 Bio printing improves life in humans.

3D bio printing is another elective that tries to fix and prompt the development of ligament, organs, cells, and tissues through biodegradable materials advanced with immature microorganisms. Through innovative work of organic medicines, the administration of undifferentiated cells has been improved as a restorative and settling asset to help contain osteoporosis malady since when the illness isn't treated in time, the issue makes a friendship the ligaments, bones, and tendons of the patient, particularly in the knees, yet with the combination of foundational microorganisms and 3D bio printing, remakes those spaces in the ligaments, consequently, this creation offers us the chance to produce a noble life, without torment for the patient and with less prescription.

This, thus, lessens the quantity of medical procedures performed with increasingly complex strategies and now and again not all that fruitful. The medical procedures are not terrible and as a rule must be performed, what ought to be considered is the plausibility of past treatment with the biotechnology of immature microorganisms and inserts arranged in a customized manner to each case and patient, which figures out how to stay away from such medical procedures.

Another favorable position of this innovation is that the venture is lower contrasted with conventional medicines and the outcomes are all the more complimenting, said the authority. On account of this innovative improvement and execution of this method, a huge number of lives can be spared. Bio printing creates a fuller life open door for individuals with no dread that if an individual is in a genuine condition of wellbeing and needs any organ, cell or tissue, they don't need to hang tight for that of any giver and they need to risk having a resistant dismissal of this organ, yet that through bio printing our cells are put in this biomaterial that can later be utilized in our creature and that doesn't produce any entanglement or safe dismissal.

Conclusions

At the end of this monographic work it is concluded that:

- In conclusion, the 3D printer still has a long way to progress within the area of technology and each time its new updates will change the panorama, perspective or point of view of people generating so that people trust more in this device and one day this 3D printer can make bio impressions of organs, skin and stem cells to all hospitals, it is known that some people do not agree with this procedure because they think it is something that goes against the natural and do not understand the true function of the printer within the medical processes.
- In if it could not carry out the sale of these types of devices to society rather only to specialized places such as hospitals because in itself, there may be creation of drugs or organs that could have been made in a non-sanitary place and without a professional, which generates the trafficking of biomaterial organs at a lower price and can be dangerous why it is not done by a professional with a medical degree.
- Should analyze why not many people know its use or use within the medical area which makes people become more ignorant and instead of investigating resort to Facebook or Instagram websites that do not contain the necessary information on these procedures.
- Generating that hospitals have access to bio printing would be a good decision, when we talk about a person is in a state of emergency and urgently needs an organ to some essential part of the body as there would be no rejection of it.
- People need to be informed and given the necessary resources so that they are clear about bioethics and how they work in hospitals, in medical procedures and in patients, what is the purpose of this, why it is created and why which is so important in medicine, since many people today suffer or suffer from some disease and these bioethics occur in any case of health.

- 3d bioprinting should be used worldwide and these machines should be brought to benefit people's health.

Recommendations

At the end of this work it is recommended that:

1. After analyzing what bio impressions are in general and coming to the conclusion that they are likely to become the future of global health, from an equitable point of view to different ways of thinking, it is recommended that people give bio impressions a chance. We are not talking about transplants only for vanity, we are talking about problems that are generated in our body that great damage and to solve them need a transplant through a bio material created by this printer.
2. It is recommended that society at some point acquire workshops for the knowledge of this type of device within the area of health and generate an open mind about it because probably in the future will be universal, and then it would be a step forward that society economically, socially and healthily speaking.
3. Another point of discussion is that to manage them requires knowledge of engineering, medicine, computer science or computer science, and people who want to acquire them should know because then they could have problems using them.
4. It is also advisable to know what are the bioethics of this unless when you go ah perform a medical procedure with it comes to happen some problem that does not harm the patient if not the doctor.

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