

# Risks of Artificial Intelligence in the Medical Field and Its Legal Implications

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## Abstract

Technology, with its advanced and diverse techniques, has emerged in human life and has begun to keep pace with our daily lives with unparalleled superiority and intelligence. The world has transitioned from traditional eras to the era of technology, with artificial intelligence (AI) entering the scientific field, which has shifted from direct reliance on the human mind to adapting to machines that control human behavior and even surpass it in terms of the quality and accuracy of service delivery.

Our study aimed to clarify the role of artificial intelligence in the medical field, balancing its importance, risks, and legal implications. It follows a descriptive research methodology based on describing the intervention of artificial intelligence applications in various health and medical services, which results in risks requiring legal intervention to address them with future-oriented perspectives to protect the legal system. The study is divided into three main sections. The first section addresses the concept of artificial intelligence (AI). The second section outlines the risks of AI technology in the medical and health field, and the third section examines legal means of addressing these risks using available legal methods.

The study concluded with several findings, the most significant of which is that the risks associated with artificial intelligence within the healthcare system may give rise to criminal liability, whether intentional crimes or unintentional offenses in the form of negligence, lack of due care, or failure to take necessary precautions.

The study also presented several recommendations, most notably the necessity of strengthening administrative oversight by the competent state authorities concerning the establishment of regulatory frameworks for granting licenses for the use of artificial intelligence applications in the medical and healthcare sectors.

Keywords: Artificial Intelligence, Imminent Risks, Medical Error, Legal Implications

## 1. Introduction

Technology, with its advanced and diverse techniques, has emerged in human life and has begun to keep pace with our daily lives with unparalleled superiority and intelligence. The world has transitioned from traditional eras to the era of technology, with artificial intelligence (AI) entering the scientific field, which has shifted from direct reliance on the human mind to adapting to machines that control human behavior and even surpass it in terms of the quality and accuracy of service delivery.

The truth is that the emergence of diverse and multiple artificial intelligence applications in the medical field has transformed the system of healing and recovery towards unprecedented digital advancement and development in the medical and health professions. Medical and health institutions have started to automate administrative files and health services, especially as complex surgical operations now adopt new techniques and precision to ensure speed, efficiency, and success. Artificial intelligence provides these services tirelessly, marking a symbol of development and a challenge to the human element.

### • Significance of the Study:

The technological system has invaded the world in an unprecedented manner in all aspects of life, generating

admiration and a fluctuation in perceptions between encouragement, motivation, and fear of the risks resulting from this intervention. Artificial intelligence applications have taken on various forms and roles in the health and medical fields, both administratively in health and medical institutions and in the field of medicine. This highlights the importance and urgent necessity of keeping pace with this development, while taking into account the expected risks and their resulting legal implications.

Therefore, our study holds theoretical and practical significance by observing the features of this development in the health and administrative fields, while also addressing the expected risks, especially the legal consequences arising from liability, and the legislative measures required to regulate the use of these applications.

- **The Study's Problem and Questions:**

Observing the importance of artificial intelligence applications in the medical and health fields, and the superior technical role that reveals unprecedented development and intervention in the most important human professions, does not preclude raising the important questions in this study in a manner that contributes to achieving its goal. This requires raising the following questions:

What is meant by artificial intelligence? What is the most prominent role played by artificial intelligence applications in the medical and health fields? What are the expected risks resulting from the use of artificial intelligence applications in the medical field? Does this have legal implications as a consequence? What are the legal methods available to address these risks in a manner that ensures the protection of the legal system in the country and the protection of individuals?

- **Study Methodology:**

Based on the uniqueness of artificial intelligence (AI) as a contemporary technological system that has intervened in an unprecedented manner in the medical field, our study highlights the importance of this intervention and examining the expected risks and legal implications from a descriptive perspective. Accordingly, the study's methodology is determined by a descriptive approach, which outlines the importance and risks of AI applications in the medical and health fields, and the resulting legal methods for addressing these risks. Furthermore, the analytical approach is used, through analyzing relevant texts, to arrive at the most important desired results and recommendations.

- **Study Plan:**

We have divided the study into three sections, as follows:

The First Section: The Concept of Artificial Intelligence.

The Second Section: The Risks of Artificial Intelligence in the Medical and Health Fields.

The Third Section: The Legal Implications of the Risks of Using Artificial Intelligence Applications in the Medical and Health Fields.

## 2. First Section

### The Concept of Artificial Intelligence

There is no doubt that artificial intelligence is a contemporary scientific term. It is a computer science based on complex technology in its contemporary form. Since this science is among the newly introduced sciences, our study necessitates clarifying its meaning in the first subsection, followed by explaining its role in the medical and health fields in the second subsection, as follows:

#### The First Subsection: The Meaning of the Term Artificial Intelligence

It is established that legislation has not addressed a definition of artificial intelligence, especially since those who follow judicial rulings notice their lack of definitions of this contemporary technological development. This has attracted the attention of jurisprudence and researchers, some of whom define it as follows: "It is that branch of computer science through which computer programs are created and designed to simulate human intelligence methods so that the computer can perform certain tasks instead of humans, which require thinking, understanding, hearing, speaking, and movement in a logical and organized manner."<sup>1</sup> Artificial intelligence has also been described as "the simulation of human behavior and cognitive processes on a computer".<sup>2</sup>

Researchers in this context view that artificial intelligence is a branch of modern engineering sciences, created by humans, featuring technology that enables machines to perform service tasks with high accuracy by analyzing data, obtaining the best results, and the ability to adapt, reason, and solve problems by simply running a search engine on a specific topic. This is of great importance in the medical and health field in its broadest sense, which includes the function of automating health and medical files and working to

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<sup>1</sup> Dr. Mohamed Abdel Zaher, *Artificial Intelligence Journalism, 4IR and Media Restructuring*, Badil Publishing House, Cairo, 2018, p. 99.

<sup>2</sup> Dr. Ahmed Ibrahim Mohamed Ibrahim, *Criminal*

*Liability Resulting from Artificial Intelligence Errors in Legislation*, PhD Thesis, Faculty of Law, Ain Shams University, 2020, p. 89.

care for patients after recovery and compliance with treatment. Even more important is the ability of medical robots equipped with artificial intelligence technology to perform complex and precise surgical operations.

### **The Second Subsection: The Role of Artificial Intelligence in the Medical and Health Field**

Contemporary societies have harnessed artificial intelligence technology to provide medical and health services to patients, doctors, and health providers. AI applications have helped provide administrative services within hospitals, such as scheduling appointments, maintaining records, and electronically processing health services.<sup>3</sup> Robots have even served as assistant physicians to human physicians,<sup>4</sup> and have played the role of intelligent doctors with expertise and precision in providing medical services, whether in diagnosis or performing delicate and complex operations.<sup>5</sup>

From our review of specialized studies, it is noted that artificial intelligence has provided the most important

services in providing remote healthcare, as patients can benefit from AI applications to monitor their health and communicate with doctors remotely. The “Pepper” robot is one of the robots used in hospitals to provide psychological support to patients and assist in daily activities.<sup>6</sup> Similarly, the “Moxi” robot helps care for patients in hospitals by providing medical tools and medical information and analyzing all types of x-rays.<sup>7</sup>

Based on the above, it can be said that artificial intelligence is important in analyzing health records, providing patient services, medical education and guidance.<sup>8</sup> It even plays the role of the doctor by performing surgical operations. Surgical robots equipped with artificial intelligence perform precise and complex surgical operations and may allow surgeons to perform operations in hard-to-reach areas through small incisions.<sup>9</sup> The specialized technology also allows for more precise movements of surgical instruments and better magnification of the surgical site, such as cystectomy, partial nephrectomy, radical prostatectomy, renal pelvic plication, and ureteral resection.<sup>10</sup> The Da Vinci Xi surgical robot is considered the best robot for medical services in

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<sup>3</sup> Dr. Mohamed Sami Al-Shawa - Medical error before criminal justice, Dar Al-Nahda Al-Arabiya, 1993, p. 76.

<sup>4</sup> Dr. Haitham Issa, Obligation to Interpretation before Contracting through Artificial Intelligence Systems, Dar Al-Nahda Al-Arabiya, 2018, p. 32, Dr. Noor Qais Shaheen, Dr. Muhammad Abbas Al-Zubaidy, Criminal Legislation challenges in Confronting Artificial Intelligence - a Crimes Analytical Study, a study published in Al-Zaytoonah University of Jordan Journal for Legal studies, Special Issue, 2024, 2024, p. 25.

<sup>5</sup> Dr. Muhammad Jibril Hassan, Criminal Liability Arising from the Harms of Using Artificial Intelligence in the Medical Field, Journal of Legal and Economic Researches, Volume No. (8), Special Issue, Faculty of Law, Sadat City University, Egypt, 2022, p. 14 and beyond.

<sup>6</sup> Aldebaran and SoftBank Robotics have launched “Pepper” robot, the first humanoid robot capable of recognizing basic human emotions and adapting its behavior to the mood of its interlocutor. The Pepper stands 4 feet 7 inches tall, equipped with a wheelbase beneath its white frame, comes equipped with advanced speech recognition and customizable language understanding technologies, and can communicate with people in 20 languages. It is able to interact with people in a natural and intuitive way, thanks to the way its gestures and movements mimic those of humans. “Pepper” excels in retail environments, offices, waiting rooms, showrooms, hotels, and hospitality settings—all businesses where customer service plays a significant role. “Pepper” Robot is one of the most advanced social robots commercially available to businesses today. It is the most facial-tracking robot and has the ability to recognize different emotions. It can be taught to recognize objects and select them in a room. It can be used to make decisions, as well as to delight, entertain, and inform others. It is a high-

tech robot.

For more information, see: gwx Robotics website. Visited December 28, 2024, at 10:07 PM. Website: <https://www.gwsrobotics.com>

<sup>7</sup> The company Diligent Robotics, headquartered in Austin, Texas, announced its new hospital robot called “Moxi”. This robot is part of the company's effort to improve the situation for healthcare workers. Robots powered by artificial intelligence (AI) have become a realistic solution to help alleviate the increasing pressure on existing healthcare staff, as many countries around the world struggle with healthcare staffing. Diligent Robotics describes Moxi as “friendly and easy to talk to,” and it certainly seems so, judging by its friendly LED-lit face and soft voice. Diligent Robotics states on its website: “Clinical staff balance patient care with a multitude of manual logistical responsibilities, such as fetching or restocking supplies or preparing patient rooms for new patients. With the additional hand of Moxi, which completes these manual logistical tasks independently without assistance, clinical staff are better able to focus on other tasks, such as patient care”.

For more information, see the press report published on Al Arabiya's official website. Visited Date December 28, 2024, at 10:20 PM, Website: <https://www.alarabiya.net/technology/2018/09/20>

<sup>8</sup> Dr. Nevin Farouk Fouad, “The Machine Between Natural Intelligence and Artificial Intelligence: A Comparative Study,” Journal of Scientific Research in Arts, Faculty of Girls, Ain Shams University, Issue 13, Part 3, 2012, p. 174.

<sup>9</sup> Dr. Muhammad Jibril Hassan, *Ibid*, p. 19.

<sup>10</sup> For more information, see the dialogue and scientific study published on Professor Mahmoud Abdel Hakim's website, entitled “Uses and Advantages of the Surgical

performing delicate and complex surgical operations.<sup>11</sup> It is controlled by a computer and features four mechanical arms that can move freely and rotate in all directions. Each arm is equipped with surgical tools and an internal endoscope that provides clear three-dimensional images. The surgeon controls the movement of the robotic arm according to the type of surgery.

Researchers in this context view that artificial intelligence technology plays an important role in advancing medical and health assistance. It is noted that it is best able to assist humans in managing medical files and records from administrative, technical, health, and medical perspectives. The robot is no longer just a medical assistant to the doctor; technological development and intervention have reached the point where it is fully relied upon as the treating physician. This intervention undoubtedly has legal dimensions concerning criminal and civil liability, based on the legal implications of this intervention.

### 3. Second Section

#### The Risks of Artificial Intelligence in the Medical and Health Fields

It is established that artificial intelligence technology has directly and technically intervened in the medical and health field to serve patients and workers in various types of services provided by medical and health institutions. The most important and dangerous of these services are issues of diagnosis, treatment, performing precise surgical operations, controlling pharmaceutical manufacturing laboratories,<sup>12</sup> and conducting medical testing and trials. Scientists and researchers have directed efforts to use data collected by artificial intelligence technologies from electronic health records and wearable devices, which has contributed to saving the huge sums previously spent in this field.<sup>13</sup>

Therefore, by explanation of the features of artificial

intelligence's intervention in the medical and health field, it becomes clear that this development and its positive aspects are countered by negative aspects in terms of the expected failures and errors, and even the risk of committing a crime with deliberate criminal intent,<sup>14</sup> especially since artificial intelligence does not take into account the ethics of the medical profession. Some studies<sup>15</sup> have demonstrated the risks of using artificial intelligence in this field, which we enumerate as follows:<sup>16</sup>

#### The First Subsection: The Ease of Disrupting or Controlling Artificial Intelligence Technologies.

Artificial intelligence technology remains vulnerable to viral attacks and technical malfunctions, which could enable others to control, manipulate, and direct it in a specific manner. This can cause serious, irreparable damage, especially since the potential for errors in programming AI applications is expected, resulting in serious consequences for individuals' lives, including causing crimes such as murder.

#### The Second Subsection: Violation of Privacy in Medical Records

It is well established that artificial intelligence technology plays a role in automating hospital, health, and medical records, reflecting the digital development in this field. However, this development may expose these records to the risk of cyberattacks, as the algorithms used to compile information about patients and their medical conditions can be manipulated, or this data can be stolen by the programmer or user of this technology.<sup>17</sup>

#### The Third Subsection: The Medical Robot's Non-Compliance with Medical Ethics

intelligence entities –from science fiction legal social control, Akron law, Journal,2016

<sup>13</sup> Dr. Nevin Farouk Fouad, Ibid, p. 174.

<sup>14</sup> For further study of medical error in criminal law, see: Dr. Mohamed Sami Al-Shawa - Medical error before criminal justice, Dar Al-Nahda Al-Arabiya, Cairo, 1993, p. 76. Dr. Osama Abdullah Qaid, The Criminal Liability of Physicians, Dar Al-Nahda Al-Arabiya, Cairo, 2003, p. 93.

<sup>15</sup> Dr. Tamer Hamed Al-Qadi, Ibid, p. 47.

<sup>16</sup> See more information: Dr. Wafa Muhammad Abu Al-Maati Saqr, Criminal Liability for Artificial Intelligence Crimes, Spirit of Laws Magazine, Issue (96), Faculty of Law, Tanta University, October 2021, p. 153

<sup>17</sup> Dr. Muhammad Jibril Hassan, Ibid, p. 22, Dr. Nevin Farouk Fouad, Ibid, p. 177

Robot," visited December 27, 2024, at 2:14 AM, electronic link: <https://www.drmaahmoudabdelhakim.com>

<sup>11</sup> The Da Vinci Xi surgical robot is manufactured by Intuitive Surgical, a company specializing in surgical medical equipment. In 2000, it was approved by the U.S. Food and Drug Administration (FDA). This robot is suitable for performing surgeries in hard-to-reach places and for complex diseases, such as gastrointestinal disorders such as liver, bile, and pancreatic cancer, etc. It is used for liver cancer, pancreatic cancer, gallbladder cancer, gallstones, and other digestive system diseases such as esophageal cancer, colorectal cancer, etc.

For more information, see the website of Bangkok Hospital, Thailand. Visited December 27, 2024, at 2:52 AM, Website: <https://www.bangkokhospital.com>

<sup>12</sup> Gabriel Hallevy, the criminal liability of the artificial

It is well established that the medical profession has a written code of honor that expresses the human conscience inherent in a compassionate human heart. Medical and health work is one of the tasks related to saving the human soul, which God has honored with the blessing of life. This, in turn, is reflected in the medical profession, including doctors, assistants, and health workers, including nurses and administrators, who perform their work with honor and integrity, as required by professional laws and regulations. This is evidenced by their wearing white, devoid of any criminal or malicious behavior. They are the pure and pious. There is no doubt that artificial intelligence does not take these ethics into account, whether it is robots that operate according to specific programming without human consideration or those that serve as tools for committing medical crimes.

#### **The Fourth Subsection: The Risks of Medication Dispensing**

Some companies operating in the pharmaceutical and medical products sector rely on robots in the medication dispensing process, and there is no doubt that cyberattacks and manipulation of the algorithms of these applications can lead to disastrous consequences for human lives.

### **4. Third Section**

#### **The Legal Implications of the Risks of Using Artificial Intelligence Applications in the Medical and Health Fields**

The reality is that artificial intelligence applications have entered the medical and health field in a manner that provides services according to the most advanced perspective. However, the risks expected to arise from this use have become predictable, resulting in legal implications based on existing legal policy, and the need to formulate a future legislative and awareness policy to prevent the imminent risks of this technology in this field, which is most in need of human life.

Therefore, we will outline the legal implications of these risks, whether they occur as a result of an illegal act or remain a possibility. This requires legal intervention to address them at their earliest stages within the context of a comprehensive legal plan. We will explain this in the following subsections:

#### **The First Subsection: Confronting the Risks of Artificial Intelligence in the Medical and Health Fields According to Criminal Law:**

It is well established that criminal law addresses acts that violate the provisions of the Penal Code and special laws. It is a law that protects individuals and the state entity and combats crime, whether it occurs as actual harmful crimes or simply because its behavior is dangerous, as it is a crime of danger<sup>18</sup>. While artificial intelligence applications in the medical and health fields are viewed as tools that help these professions improve the quality of services, they are more likely to result from unintentional errors due to the absence of criminal intent. Although this is not absolute, this does not mean that medical and health work is free of the intentional crime, provided criminal intent is present.<sup>19</sup>

Whereas, the rules of unintentional error can be raised regarding facts that violate the Penal Code<sup>20</sup>, which are committed without the presence of direct or potential criminal intent, and are based on what the law explicitly stipulates regarding criminal forms, in accordance with the text of Articles (12, 243) of Penal Code No. (74) of 1936 and its amendments applicable in the Gaza Strip, and the corresponding texts of Articles (238, 244, 360) of the Egyptian Penal Code No. (58) of 1937 and its amendments, especially with regard to acts of recklessness, negligence, lack of caution, and violation of laws, decisions, regulations, and systems.

Accordingly, the risks previously enumerated regarding the existence of unintentional errors can be classified as negligence resulting from the lack of regular monitoring and inspection of AI applications, leading to the hacking, disruption, or control of AI technologies<sup>21</sup>, as well as the lack of caution against

<sup>18</sup> See for more information: Dr. Tamer Hamed Al-Qadi, Major Crimes Against Public Order, Nissan Library, 2023, p. 20 ff.

<sup>19</sup> Dr. Abdullah Ahmed Al-Falasi, Criminal Responsibility Resulting from Artificial Intelligence Errors, Legal Journal, Volume (9), Issue No. (8), Faculty of Law, Cairo University, Khartoum Branch, 2021, pp. 2861 ff., Dr. Tamer Hamed Al-Qadi, Ibid, p. 70.

<sup>20</sup> Muhammad Muhammad Abd Al-Latif, Liability for Artificial Intelligence between Private and Public Law, a research presented at the Conference on the Legal and Economic Aspects of Artificial Intelligence and Information Technology, May 23-24, 2012, Faculty of Law, Mansoura

University, Special Issue of the Twentieth Annual Conference, p. 9.

OPECS, Rapport « Pour une intelligence artificielle maîtrisée, utile et démystifiée », T. 1, 15 mars 2017, p. 129.

<sup>21</sup> D. ROETS, Réflexions sur les possibles implications du principe de précaution en droit pénal de m, imprudence, Rev. Sc. Crim., n2, 2007, p.252.

L. Ellyson ; La responsabilité criminelle et l'intelligence artificielle : quelques pistes de réflexion, art. préc, p.889

Ibrahim Zayed, Criminal Liability for Artificial Intelligence Errors, Eighth Scientific Conference, Technology and Law, Spirit of Laws Magazine, Faculty of Law, Tanta University, Arab Renaissance House, 2023, p.

false and harmful results that may be revealed by a medical robot,<sup>22</sup> or a misdiagnosis, which results in the dispensing of the wrong type of medication.<sup>23</sup>

It can be said that the issue of assessing and detecting errors falls on the investigating authorities. The Public Prosecution begins by conducting preliminary investigations, and then the judiciary undertakes the final investigation to determine the existence of an unintentional crime or not. However, the issue of proving error remains a matter of discretion for the court, based on relevant data and reports. In several cases brought against the company that manufactured the Da Vinci Xi - Surgeon robot, the US courts ruled that it was not guilty due to the difficulty of proving that there was an error in the robot's manufacture, even though Da Vinci Xi gave false messages about the patient, especially since it refused to carry out the orders of the operating surgeon. However, the court ruled that it was not liable.<sup>24</sup>

### **The Second Subsection: The Impact of Artificial Intelligence Risks in the Medical and Health Field According to the Provisions of Civil Code**

It is established that Civil Code contains provisions ensuring compensation for those harmed by unlawful acts infringing protected interests. Since the risks of Artificial Intelligence applications are grounds for compensation, some studies<sup>25</sup> have rightly concluded that addressing these risks through Civil Code involves stipulating civil liability, both contractual and tortious, depending on the legal nature applicable to the harm caused by Artificial Intelligence. This is based on the concept of the "guardian of things," where the controller of the medical robot or AI application is considered its guardian, who may be held liable for negligence in guarding the thing (the Artificial Intelligence application).

In the same context, some jurisprudence has argued

that addressing risks lies in expanding civil liability to include everyone who caused the error, whether the guard, the manufacturer, or the controller. However, the general application of civil liability converges with the obstacle of proof, as liability only falls on the one who caused it. In accordance with this, in several cases brought against the company that manufactured the Da Vinci Xi - Surgeon robot, the US courts ruled that it was not guilty due to the difficulty of proving that there was an error in the robot's manufacture, even though Da Vinci Xi gave false messages about the patient, especially since it refused to carry out the orders of the operating surgeon. However, the court ruled that it was not liable.<sup>26</sup>

According to the aforementioned, researchers view that civil liability, under the provisions of civil code, is one of the legal mechanisms resulting from the risks of artificial intelligence applications when damages requiring compensation occur. The stipulation of this liability, in accordance with general provisions, is undoubtedly one of the means of legally addressing these risks, whether the cause is the manufacturer, the programmer, the controller, the owner, or the possessor of the robot, based on the guard base or defective objects.

### **The Third Subsection: Administrative Control**

Administrative Control by the competent authorities in the state is considered a necessary safeguard for preserving public order. Given that the use of artificial intelligence applications in the medical and health fields is a fact that may raise the issue of risk and harm, and even lead to the occurrence of illegal acts, with consequential impacts that affect public order. There is no doubt that administrative Control has a duty to intervene to provide legal protection by issuing administrative decisions from the competent authorities. These decisions establish licensing controls

139. Dr. Omar Al-Obaidi, *Contemporary Applications of Crimes Resulting from Artificial Intelligence, A Comparative Study from an International Law Perspective*, First Edition, Arab Center for Publishing and Distribution, Cairo, 2022, p. 585. Dr. Hanan Al- Hasanat, *Criminal Liability for Errors in Artificial Intelligence*, Al-Zaytoonah University of Jordan Journal for Legal studies, Special Issue, 2024, p. 789.

<sup>22</sup> D. ROETS, *Réflexions sur les possibles implications du principe de précaution en droit pénal de m,imprudence*, Rev. Sc. Crim., n2, 2007, p.252.

L. Ellyson ; *La responsabilité criminelle et l'intelligence artificielle : quelques pistes de réflexion*, art. préc, p.889

Ibrahim Zayed, *Criminal Liability for Artificial Intelligence Errors*, Eighth Scientific Conference, Technology and Law, Spirit of Laws Magazine, Faculty of Law, Tanta University, Arab Renaissance House, 2023, p.

139. Dr. Omar Al-Obaidi, *Contemporary Applications of Crimes Resulting from Artificial Intelligence, A Comparative Study from an International Law Perspective*, First Edition, Arab Center for Publishing and Distribution, Cairo, 2022, p. 585. Dr. Hanan Al- Hasanat, *Criminal Liability for Errors in Artificial Intelligence*, Al-Zaytoonah University of Jordan Journal for Legal studies, Special Issue, 2024, p. 789.

<sup>23</sup> *Mracek v Bryn Mawr Hospital*, 610 F Supp 2d 401 (ED Pa 2009), aff'd, 363 F App'x 925 (3d Cir2010).

<sup>24</sup> *Mracek v Bryn Mawr Hospital*, 610 F Supp 2d 401 (ED Pa 2009), aff'd, 363 F App'x 925 (3d Cir2010).

<sup>25</sup> F.G'Sell, *Vers L'émergence d'une responsabilité numérique*, D.IP /IT, 2020, p.153.

<sup>26</sup> *Mracek v Bryn Mawr Hospital*, 610 F Supp 2d 401 (ED Pa 2009), aff'd, 363 F App'x 925 (3d Cir2010)

for the use of artificial intelligence applications in a manner that ensures addressing risks, either before or after the occurrence of risks<sup>27</sup>.

Researchers in this context view that government administrative decisions constitute legal Implications that prevent the risks arising from using artificial intelligence applications in the medical and health fields if their use results in illegal acts or legal liability of any kind. Administrative Control, exercised in various forms, constitutes a real guarantee to confront these risks. The most important of which is the issuance of administrative decisions related to public order, whether the decision prohibits the importation of a robot, prohibits the use of an application, confiscates it, or denies use, regardless of the form of the decision.

#### **The Fourth Subsection: Legal Awareness**

It is well established that the legal awareness is one of the necessary guarantees for knowing one's rights, fulfilling one's duties, and being aware of the legal effect. Legal Awareness has become both a right and a duty for individuals in the state, and indeed a necessary obligation for those working in both the public and private sectors, with the goal of preserving the state, which can only be achieved by spreading the culture and developing societal awareness<sup>28</sup>.

Since legal awareness takes various forms, awareness of the science of artificial intelligence, its various uses in various aspects of life, and its legal implications are among the necessary guarantees and precautions to address the risks of artificial intelligence, especially in the medical and health field, which combines the interests of the patient with the duty of the state.

### **5. Conclusion**

Our study focused on the role of using artificial intelligence applications in the medical and health field, in terms of the three most important axes: (importance, risks, and legal implications). These axes contain aspects of the importance of the study, its questions, and the division of its research plan, which led us to several conclusions and recommendations, which we outline in the following points:

#### **First: Results**

(1) Artificial intelligence (AI) is a highly advanced technological science, and the most capable, in terms of accuracy and technicality, of directing algorithms to perform specific tasks. This technology has demonstrated several applications that can be used in

the medical and health field, most notably medical robots, such as the “Da Vinci Xi” robot, which performs the most delicate and dangerous surgical operations.

(2) We have concluded that the risks of AI in the health and medical system may result in crimes, whether intentional when criminal intent is present, or more often unintentional crimes in the form of negligence and lack of caution. These crimes entail legal liability of various types, criminal, civil, and administrative. No error is without consequences. AI applications remain tools in the medical and health field, invoking legal liability for those who control them, their manufacturers, owners, or others, depending on their use.

(3) Administrative Control by the competent authorities in the state is considered a necessary guarantee for providing legal protection through the issuance of administrative decisions by the competent authorities that determine the controls for granting licenses for the use of AI applications in a manner that ensures risks are addressed, both before and after they occur.

#### **Second: Recommendations**

(1) We recommend that Arab legislation pay greater attention to regulating the use of artificial intelligence applications in the medical and health fields, under specific laws that provide legal protection for every legitimate interest, ensure the effectiveness of medical and health work, and avoid the risks expected from linking medical operations to technological work that transform medical cases from human monitoring to electronic monitoring.

(2) To avoid the risks associated with the use of artificial intelligence applications and preserve their technical gains and importance, we recommend that the management of medical and health institutions conduct ongoing technical training for workers in administrative, health, and medical fields, under government technical supervision and with monitoring and oversight from the Ministries of Health and Interior.

(3) We recommend strengthening administrative control by the competent authorities in the country regarding the determination of controls for granting licenses for the use of artificial intelligence applications in the medical and health fields, in a manner that ensures addressing anticipated risks, both before and after their occurrence. Administrative control should take various forms, the most important

<sup>27</sup> Dr. Tamer Hamed Al-Qadi, Ibid, p. 88.

<sup>28</sup> See for more information: Our Professor Dr. Khaled

Mohamed Al-Qadi, Law and Building Awareness, Egyptian General Book Authority, first edition, 2024, p. 13.

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