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Civil Liability for the Error of the Robotic Doctor: A Comparative Study

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ABSTRACT

The countries of the world have recently witnessed widespread progress in the field of artificial intelligence, as it has begun to enter all areas of our daily lives, especially in the medical field, which has made specialists expect that in the near future, artificial intelligence will be indispensable. The study in this research focused on dealing with the concept of automated doctor intelligence, as well as its legal nature. Then, through this research, we also addressed the legal liability for damages in the application of artificial intelligence, in which we dealt with contractual liability, tort liability, as well as substantive liability. The fact that civil liability for damages arising from the use of artificial intelligence in the profession of robotic doctors is one of the most important emerging topics, as this use aims to employ modern technologies to serve humanity. The study reached many results, the most important of which is the recognition of the legal personality of artificial intelligence in "determining the person responsible for the damage." which may be caused by the artificial intelligence," recognition of the rights of the artificial intelligence "protects it from the mistreatment of others, and the obligations arising from its actions protect others from it.

Keywords: *robotic doctor, autonomy, medical robot, objective responsibility.*

I. INTRODUCTION

The current era is witnessing a massive digital revolution in all different areas of life. The electronic system has become imposing its grip on all the work and activities of different people. There is no doubt that the race for excellence and competition does not exclude a profession or a job as artificial intelligence begins and is making its way to many professions that are limited to humans, as is the case in the medical profession. In the midst of this increasing development, many legislations have emerged regulating the work of robots and codifying them within their legal system, especially in the field of civil legislation. Despite the positive aspects of artificial intelligence, it is not devoid of negatives, as these legislations regulate the responsibility it accrues as a result of errors resulting from it. Its actions, whether direct or indirect, especially

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in the medical field. Many laws stipulate that there is a contractual responsibility that the doctor is bound by towards a patient. Under this responsibility, the patient can demand compensation if the doctor is proven to be wrong. The judiciary has also settled on the idea of taking into account the doctor's obligation and responsibility for the safety of the patient. For the patient, the doctor cannot escape his responsibility except in the event of damage occurring as a result of a foreign cause that has nothing to do with the doctor, a mistake on the part of the patient himself, a sudden event, or force majeure outside the control of this doctor. One of the most important pieces of legislation regulating this responsibility is the Iraqi Civil Law No. 40 of 1951. However, it does not regulate all matters in the field of liability for damages to the medical robot, as we are facing a legislative vacuum with regard to regulating its work and responsibilities. Among the most important legislations regulating this responsibility is UAE legislation, as we find it in the "Federal Civil Transactions Law," the "Federal Medical Liability Law No. (4) of 2016," and "Executive Regulations No. (40) of (2019). Based on the above, we will discuss in this research we examine the nature of the robotic doctor and the liability arising from his actions.

The problem with the study is that the robot (robot doctor) does not have sufficient ability to make a judgment or prediction, so it cannot be held responsible for its error. However, if a mechanical problem occurs during medical assistance, can we sue the robot manufacturer and the system programmer, or must an investigation be conducted? Whether the robot is used under normal conditions of use, whether the defect is due to poor programming or design, it is important to determine the responsibilities of all stakeholders during medical assistance under the robot doctor. Also, is it possible for artificial intelligence to be a party to the responsibility independently of the human? Can the liability provisions be applied to him, and to what extent are the general rules in the Iraqi Civil Code sufficient to confront the rapid development in the field of artificial intelligence related to the robotic doctor?

In order to give a comprehensive explanation of both the theoretical and practical aspects of the research topic, we will follow the comparative analytical approach by analyzing the legal texts contained in both the Iraqi Civil Code and the modern rules in European Civil Law regarding the topic, while giving a detailed explanation of the content of the comparative legal texts, supported by the opinions of jurists with Explaining what the Iraqi judiciary and comparative judiciary have settled on in this regard.

For the purpose of studying civil liability for the error of the robotic doctor, determining all legal aspects, and clarifying the position of jurisprudence and the judiciary, we will address in this research two independent demands. We will dedicate the first to the nature of the robotic

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doctor and the second requirement to study the legal liability for the error of the robotic doctor, and we will follow that with a conclusion that contains the overall conclusions and recommendations that we will reach.

(A) The concept of the robotic doctor

In the last decades of the last century, information systems have witnessed radical and rapid changes as new applications for information systems and modern standards for designing these systems have emerged. Although applications of artificial intelligence are important in many fields and fields, for the field of medicine, they represent an urgent and indispensable necessity, as Many studies and research have emphasized the importance of these applications in the field of medicine. In light of that, I divide this requirement into the following two sub-sections:

(B) Theoretical review of the robotic doctor

Through reading and research, it became clear that the creator of the term artificial intelligence is the scientist John McCarthy, who is known as the father of artificial intelligence. He defined it as "an engineering science that creates intelligent machines, especially in the field or computer program." (McSharry, 2023). Despite the interest in artificial intelligence in all fields, especially legal, there is no unified definition yet for artificial intelligence. (Samoili et al, 2020), Some believe that artificial intelligence is the process of imitating the human mind through computer systems and programs, in their behavior, thinking, and decision-making.(Khalifa, 2017). While some defined it very briefly as "the branch of computer science related to the automation of human behavior." (Khorasani, 2008), Artificial intelligence is defined in more detail as: "One of the modern technologies that was developed in the last century, which includes a set of software that helps managers and workers in making decisions for all the organization's operations. It is characterized by sophistication and progress and provides computers with a set of activities that help them practice behavior characterized by intelligence."(Younes, 2012).

As for the robot doctor, it is an intelligent robot or one designed specifically to intervene in the field of health and provide medical services. The robot is known legally and according to the rules of the civil law of the European Union countries, which classified it into two categories, the first being robots for personal needs and medical robots that have "the ability to gain autonomy thanks to sensors." Alternatively, exchanging data with the surrounding environment and analyzing it, the ability to learn through experience and interaction, the structure or physical form of the robot, and finally the ability to adapt its behavior and actions to the environment." The Korean law defines an automated robot in its second article as "a mechanical device that

perceives the external environment for itself, distinguishes conditions, and moves voluntarily." (Muhammad, 2021).

As for the Iraqi civil legislation, it is devoid of a definition of artificial intelligence, but its definition came within the Iraqi Electronic Signature Law No. (78 of 2012) in Article One, Eighth Paragraph, of which the electronic medium is "a computer program or any other electronic means used in order to implement a procedure or respond to a procedure with the intention of... Create, send and receive information"(Electronic Signature and Electronic Transactions Law, 2012). It is noted that the Iraqi legislator defined one of the artificial intelligence systems, which is the electronic mediator, through technical elements common to it and artificial intelligence techniques. We conclude from these definitions contained in the above legislation that the automated doctor (every device whose design includes a computer or any electronic means) and the Iraqi legislator have defined it as an electronic intermediary.

(C) Legal nature of the robotic doctor

Naturally, a human being is distinguished by his ability to think and find solutions when dealing with different situations, but in contrast, he faces a robot, which also has these abilities. However, with a limited space that is compatible with the work devoted to it, as it can analyze and learn, and from here a question arises about nature. The legality of artificial intelligence systems. Is it possible to recognize the legal personality of this artificial intelligence and then be able to hold it accountable for its actions.

The law restricted personalities to two types: the natural person and the legal (legal) person. The law specified the characteristics of each of them, which corresponds to their nature and specificity. The law recognized these two legal persons. The natural person is the one who represents matter, that is, the tangible thing. In contrast, the second, which represents the legal person, is the one who represents a legal entity, which is an intangible thing that aims to achieve multiple purposes, which is represented by many associations, institutions, and companies that the law gave a legal entity. Recognizing the legal nature of artificial intelligence requires understanding the meaning of the legal person and its types. The legal person is a group of people or funds created to achieve a purpose and has a legal personality that enables it to exercise rights and perform obligations. It also has an entity independent of the people and funds that make up it, and the legal person has a liability.

Independent financial, litigation capacity, and virtual legal existence. The will of the legal person combines and represents the will of the founders, so the will of the legal person replaces the will of its constituents in forming legal relations and their effects.(Iraqi Civil Law, 1951).

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In view of the rights enjoyed by the legal person, questions arise about the possibility of assimilating the personality of the robot doctor into being a legal person who enjoys rights and is bound by some obligations in order to relieve the responsibility of the owner of this robot. Some have adopted two approaches to answering this question. The first is where some jurists go to deny the legal personality of artificial intelligence. Since the idea of legal personality stems from the human perception of regulating human relations, how can it be applied to artificial intelligence and its applications, such as robots?

For example, saying that artificial intelligence is granted legal personality is nothing but a means for manufacturers and translators of artificial intelligence technologies to evade responsibility for the harm caused by these technologies and to rid them of their risks. (Qusi, 2018). Supporters of the second approach argue that artificial intelligence, even if it appears independent of its user or designer in some innovations and inventions, this independence is relative because it may need human intervention in many cases to provide it with some data necessary to start work or to update and continue it, which indicates that He enjoys innovation and invention, in this case, it is humans, not artificial intelligence. Assuming that the robot acquires legal personality, as one of the most important applications of artificial intelligence, as an electronic or virtual person, as it is responsible for compensation against others. Artificial intelligence participates in its creation as an entity of more than one person. Such as the product and the programmer, in addition to its use by the owner. When damage occurs, the victim is forced to search for the responsible person. Here, artificial intelligence entities must be treated as legal persons to subject them to legal accountability like legal persons. Giving them what is known as functional or technical qualifications that allow them to conduct business and conclude deals independently on the condition of insurance and restricting their use as a first stage to technically qualified companies that have the financial capacity to bear the financial and technical consequences arising from artificial intelligence. (Khatib, 2020).

This would strengthen the current legal system to address the challenges that artificial intelligence can raise. We support what the supporters of the second doctrine are saying, as it contributes to the formation of a legal cover that facilitates the use of artificial intelligence technology, thus advancing the medical field and health care significantly, which has led many major investment companies to compete in benefiting from this technology in health care and serving patients, as the use of this technology is not limited to The technology involves merely entering and processing data, but extends to analyzing it and arriving at many accurate results that contribute significantly to diagnosis in a record period. (Salama& Abu Qura, 2014).

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II. LEGAL RESPONSIBILITY FOR THE ERROR OF THE ROBOTIC DOCTOR

There are two types of civil liability in the "Iraqi Civil Law No. 40 of 1951," which are contractual liability and tort liability. In the event that one party violates the contract concluded between the two parties, contractual liability arises. However, in the event of a violation of any obligation issued by law, liability for the harmful act arises. To determine "liability for the damage caused by the robotic doctor," it is necessary to investigate the basis of liability for the doctor's error in accordance with the rules of the Medical Liability Law and the rules of civil law. Given that the basis of liability for damage caused by robots and artificial intelligence has not yet been determined, given the recent use of robots, jurisprudence has examined several legal foundations upon which robots' liability can be established. In light of this, this requirement is divided into the following two sections:

A. The legal basis for the liability of the robotic doctor

Artificial intelligence was created to serve humanity, which is what was adopted by the principles of the European Union, which stipulate that the robot is a machine that serves and obeys humans. However, despite this text, legal jurisprudence differed in determining the legal basis for the liability of the robotic doctor, as some argued that the theory of liability for product defects applies to liability. In the various damages that arise from the robot, the European legislator has updated this theory in accordance with the directive that specializes in liability for products that have defects, issued in 1985 No. 374/185. This liability is intended to mean the liability prescribed by the law, in which the basis is the lack of safety and security in the product, which falls directly on the manufacturer, who is fully responsible for the defects of this product. Therefore, European law was keen to approve more laws that regulate this responsibility within a framework outside the scope of the concluded contract, as this law sets a framework for compensation for damage resulting from Product defects, as compensation is not claimed for defects in that product if the factory or manufacturer discovered that defect. In order for objective responsibility to fall on the producing party, this product must be defective, and this defect has caused damage.(Karrar & Hossam ,2019). The French Civil Code indicated in its article No. (1245/1), which stipulates the responsibility of the party that exports the product for the damages resulting from it, whether this is a contractual obligation or a non-contractual obligation. This responsibility aims to achieve the principle of equality between the various affected people, whether there is a contractual nature between them. The affected person and the party that exports the product or not, but if the contractual capacity is achieved between the affected person and the party issuing the product resulting in defects in the product, the

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position of the affected person is better than the absence of the contractual capacity, as the contractual capacity gives the contractor a number of advantages granted to him in accordance with what is stipulated. He has contractual responsibility, as the injured person obtains a guarantee for hidden defects in the product. Also, contractual responsibility obligates the product issuer to inform the buyer of the risks resulting from the use of this commodity when he uses it.

This liability distinguishes it, and it has laws that govern it, given that it was founded on a specific system that is applied to people affected by defects resulting from various products, known as civil liability. This damage is not linked to the nature of the product and the extent of its seriousness, and this relationship arises through contracting or non-contracting accordingly. It can be said that this responsibility cannot be considered a tortious liability, nor can it be considered a contractual one. Rather, it is considered an objective responsibility that has a special nature. (Fatlawi, 2015), As for the second trend, it went to what the European legislator classified the person responsible for the robot as a representative and not a guard. The legislator also went to the possibility of considering the robot's representative as his guarantor, as the concept of a guarantee is manifested by a pledge or fulfillment to the creditor on behalf of the debtor to fulfill the obligation between them in the event of the creditor's inability to fulfill. Thus, in the case of the robot, there is difficulty in this because there is no contract or obligation between the affected person, who represents the creditor, and the robot, which may result in damages when operating it.

Moreover, jurists have approved that a person is not obligated by the force of law to provide bail, which contradicts the robot, as the human representative becomes Commitment to pay compensation to the injured party. Likewise, the robot is not in the legal subordinate position of a human being because the donor has the authority to supervise and control the fully qualified subordinate and has the right to recourse against him. A subordinate is a person with a subordinate relationship, not a representative one. Also, the human representative is not an assignee of the debtor robot as part of his debt transfer because the debt transfer arises from an existing obligation under which the assignee is obligated to provide the amount of the obligation imposed on the assignor. In contrast, the obligation does not arise for the human representative except in the event of damage caused by the robot that entails compensation to the injured person. (Qusi, 2018). This theory also differs from the idea of legal representation in that the representative represents another person with the force of the law in order to represent him and not bear responsibility for him. Also, although this theory is somewhat similar to the liability insurance system in that it is a guaranteed interest insurance for a robot in the face of unspecified

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harm before the damage occurs, it differs from it in that the insurance system aims to achieve the interest of the one who caused the damage.In contrast, this theory aims to compensate the injured party must be subject to fair rules, and a licensed company must carry out insurance. The robot and compensation for those harmed as a result of operating errors and by force of law. It should be noted that the "liability of the human representative" may be contractual as if the robot failed to perform the task entrusted to it for the benefit of the person contracting with the manufacturer, hospital, or doctor who uses the medical robot. It may also be liable for the harmful act through the robot making independent decisions on its part as a result of the characteristics of independence, self-learning and decision-making that it enjoys. European law has confirmed that the robot's independence makes it one of the rules of contractual liability. (Manko, 2017).

Whatever the legal adaptation of this theory, the human representative takes four forms, the first of which is the factory owner, who represents the robot maker or the institution responsible for producing the robot and responsible for the defects of this machine, as the manufacture of this machine may result in unaccounted risks. Therefore, European law has approved that It is necessary to apply the provisions of liability to all locally manufactured products referred to before, and the application of liability is in general and in the field of medicine in particular, due to the accuracy of that field and the occurrence of errors that the robot cannot deal with. The robot may have a defect that leads to the patient moving during surgery or dealing with the patient's incorrect treatment, resulting in a deterioration in his health condition, and this may be the result of negligence on the part of the manufacturer in manufacturing and maintaining the robot. Second: The operator, who is the professional person who exploits the robot, as in the case of errors in payments, bank transfers, or customer accounts, in areas where some bank departments use robots in the banking field. Third: The owner, who is the person who personally operates the robot. To serve him or his clients, such as a doctor who owns a hospital that owns and operates a medical robot to perform medical diagnosis, conduct medical tests, or perform surgical operations, and an error and damage occur that requires civil liability. Fourth, the user is the person who uses the robot other than the owner or operator, and according to the expression of the European legislator, The user of the robot is responsible for any behavior that leads to harm to others, and the user may be a beneficiary of the robot. The self-driving robot may be used by a group of people traveling via an electronic board, and one of them sends an incorrect command to the bus, causing a traffic accident. Here, the error must be proven, or the damage is caused by the injured person, which is what is stipulated in the provisions of liability. This error or damage differs from the error approved by the law for defective products. Hence,

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the errors made by the company that owns or manufactures the robot must be proven, which must make more efforts to avoid errors and damages resulting from the robot. In addition to the need to prove the occurrence of damage and the relationship causing it. (Qusi, 2019).

We, in turn, support the second approach, as it created a new legal situation when adopting the "human representative" system, that is, assuming the existence of a legal representation between the robot and the human responsible for it for the purpose of holding the human responsible for the actions of the robot.

B. Types of legal liability for the robotic doctor

As we have previously shown, civil liability for artificial intelligence damages is divided into contractual, tort, and substantive liability, and we will address these responsibilities in turn.

1- Contractual responsibility in the field of robotic doctor work

It is known that, according to the law, when parties enter into contracts or when they conclude valid contracts and one of the parties does not fulfill or breach his obligation stipulated in the contract, the other party has the right to be relieved of his obligation, in addition to his right to demand compensation as a result of the party's failure to perform. The other for his obligation and the value of compensation may be specified in the contract itself. Breach of contract has many different forms, including, for example, the seller's failure to deliver the sold item in accordance with the terms and specifications of the contract. Contractual liability arises in some cases; for example, if the robot does not comply with the terms of the contract or stipulated conditions, then the buyer has the right to terminate the contract. Here, contractual liability arises when the robot does not perform the performance agreed upon in the contract, even if this does not result in damage or injury (Mansour, 2006). The relationship between the patient and the doctor is a contractual relationship, and the content of the contract determines the doctor's obligations towards his patient. According to it, the doctor is obligated to exert the effort and protection required to achieve the obligations that have been agreed upon unless the doctor's Commitment is an obligation to achieve a result, and the contractual bond between the doctor and the patient remains as long as the contract lasts. Medical treatment basically began based on the doctor's offer and the patient's acceptance (Muhammad& Heba, 2020).

We do not support attributing medical liability for the actions of a robotic doctor due to not supporting the previous trend, as it is the subject of criticism given that applying "contractual liability to medical robots" is not sufficient to confront the damages it causes, in addition to the fact that it is directed to the doctor and not to the robot, as it is still not He is eligible to be a party to the contract. The doctor can evade responsibility if he proves that the damage is due to

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a reason for which he is not responsible, such as if the robot acted outside of what it was programmed and designed to do, and this leads to the loss of the patient's right to receive appropriate compensation for the damage. Reality is upon him.

2- Medical liability for the harmful act of the robot doctor

The stipulated duties of the doctor are for the doctor to do what he can to care for and heal the patient, which is in accordance, in other than exceptional circumstances, with the principles and charter of the medical profession, as the doctor is fully responsible for any negligence that comes from him towards the patient within the limits of his profession and does not occur by a doctor at the same level. The professional and the same external circumstances surrounding that responsible doctor are also responsible for any error, no matter how serious it is, and according to what is stipulated in the system of liability for harmful acts, the three pillars related to tort liability must be proven, which is the condition for the injured person to obtain appropriate compensation, and through this, Applying tort liability to the person responsible for using the robot and then the damages that result from it. For example, suppose a doctor relied on a clinical decision support program supported by artificial intelligence to prescribe a medication, but the program issued an incorrect recommendation that could have been noticed and was ignored by a specialist doctor. In that case, it is possible to hold him accountable. The doctor informs the patient of the resulting damage and injuries expected to occur (Muhammad& Heba, 2020).

We, in turn, do not support assigning responsibility for a medical robot's error to the doctor supervising its use because, when it comes to the autonomy of artificial intelligence, it is difficult to determine the party or person who caused the damage. Thus, it is difficult to establish a causal relationship between the error and the damage, and this is what Article 211 of the Iraqi Civil Code emphasized: "If The person proved that the damage arose from a foreign cause beyond his control, a sudden accident, force majeure, the act of a third party, or the fault of a third party. The injured person was not bound by the guarantee unless there is a stipulation or agreement to the contrary. (Iraqi Civil Law,1951)

3- Objective liability for the errors of the robotic doctor

Devices with artificial intelligence are technically complex, which makes it difficult for the injured person to become familiar with them and discover what is wrong with them due to the lack of specialized technical expertise in these devices, which makes it necessary to be lenient and facilitate the injured person as much as possible in order for him to obtain compensation for the damage. The new legal situations raised by artificial intelligence technology require a different treatment than the traditional rules regarding determining the person responsible for

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harm to artificially intelligent machines, as the traditional foundations based on defect and error must be abandoned. Some take objective responsibility and impose it by dealing with the use of artificial intelligence in some places and circumstances on the basis that it is a dangerous and abnormal activity, and this leads to a departure from the traditional system of civil liability, which requires error as its basis.(Maghribi& Taha, 2023), Many legislations have turned to it as a basis for civil liability to keep pace with technological development in artificial intelligence, especially after it was proven that the injured party was unable to prove the fault and the causal relationship between him and the damage within the framework of traditional civil liability. Within the framework of objective liability, the injured person is sufficient to prove the damage without the need to prove fault. Objective liability is responsibility for an act in which the error had no role. (Dictionary of Public International Law, 2000), Some define it as the responsibility for which it is sufficient to establish a causal relationship between the damage and the activity from which it originates, without regard to the fault of the responsible person, even if the activity itself is sound and correct.(Abdel Basset, 2003). It was addressed by European Directive No. 374/85/EC issued on July 25, 1985, which establishes product liability on the principle and basis of liability without fault in the event of damage caused by a defective product. If there is more than one person responsible for the same damage, the liability is joint. Consequently, European Union law governs liability on the basis of damage caused by products and not only on the contractual scope. It is not necessary to claim compensation on the basis of an error on the part of the company producing or manufacturing artificial intelligence. The drafters of the European directive emphasized that the applicable system is an objective liability, but it is not sufficient to establish liability that the product causes damage alone. Rather, the product must be defective, and the defect must be what caused the damage, subject to compensation. Article 6 of the European Directive states that a defective product is a product that does not have legitimate safety, which is expected. (Lotfy, 2021). This is what the French legislator followed and adopted, as Article 4/1386 of the French Civil Code stated that the product is defective from the point of view of the law when it does not meet the safety expected by the law. (Wagner, 2018).

In our opinion, we believe that the injured party only needs to prove the damage, and there is no need to prove that the artificial intelligence device has a defect. Rather, the product or manufacturer needs to acknowledge that there is no defect in the product, but rather the damage occurred for external reasons, and we also see that the liability should be joint among all those involved. To produce, manufacture or use artificial intelligence in order to avoid the problem of proving the defect or proving the person responsible for the defect, with the aim of providing

the maximum amount of guarantees to the victim and requesting compensation to cover the damage. This is based on the idea of taking responsibility and bearing responsibility.

III. CONCLUSIONS AND RECOMMENDATIONS

After completing the study of civil liability for damages resulting from the use of artificial intelligence in the robotic doctor profession, we must state the most important conclusions and recommendations that we have reached through this study, which are as follows:

A. Conclusions

The application of artificial intelligence helps specialists in reducing medical errors. It also contributes to developing the medical sector and detecting diseases early or predicting them before they occur, as well as anticipating treatment methods and providing the best health care to patients with extreme accuracy.

The concept of artificial intelligence" has recently attracted widespread attention from decision-makers in various organizations, as interest in this concept has become adopted by many organizations as a basic strategy for improving performance to ensure its survival and continuity and to increase its growth opportunities and profitability.

The recognition of the legal personality of artificial intelligence is to identify the person responsible for the harm that the artificial intelligence may cause, the recognition of the rights of the artificial intelligence protects it from the abuse of others, and the obligations arising from its actions protect others. To determine liability for damage caused by robots, several jurisprudential trends have emerged, the most important of which is substantive liability, which is considered a special type.

The injured party only needs to prove the damage, and there is no need to prove that the product (artificial intelligence device) is defective. Rather, the product or manufacturer needs to acknowledge that there is no defect in the product but rather that the damage occurred for external reasons.

B. Recommendations

It is necessary to hold qualification courses for medical and health personnel, give them adequate training on how to use medical robots, and hold scientific seminars and conferences in law colleges in order to spread awareness of the legal problems resulting from the use of artificial intelligence devices. Spreading the culture of robots Through training information technology within the school curriculum in order to open horizons in the field of modern science and technology.

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