PUBLIC HEALTH AND TECHNOLOGY

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ABSTRACT

All facets of medicine, including disease prevention, diagnosis, treatment, and post-treatment management, could be impacted by digital medicine. Researchers studying digital technology are also looking into possible uses for thyroid disease in the field of thyroid ology. Based on ultra-sonographic (US) images, recent studies utilizing artificial intelligence (AI) and machine learning (ML) have reported reasonable performance for the classification of thyroid nodules. Based on cytopathology findings, AI/ML-based techniques have also demonstrated good diagnostic accuracy for differentiating thyroid lesions into benign and malignant forms. The shortcomings of fine-needle aspiration cytology and conventional thyroid US could be overcome with the help of AI/ML techniques. A database on the internet has been created for thyroid cancer treatment. Apart from functioning as a national thyroid cancer registry, it is anticipated to function as a clinical platform to enhance thyroid cancer treatment and as a research platform offering extensive big data specific to the disease. Thyroid dysfunction may be predicted by bio signal monitoring using wearable technology, according to the evidence. The management and early detection of thyroid dysfunction may benefit from this real-world monitoring of thyroid function. Future research in the field of thyroid ology is anticipated to be even more active, focusing on the variety of digital medicine technologies and their clinical applications.

Keywords: Digital medicines Thyroid, Artificial intelligence, Machine learning, Database.

INTRODUCTION

Digital medicine has become one of the hottest topics in medicine over the past decade. A number of conferences, forums, and academic societies and journals have been established that focus on digital medicine or digital healthcare, and the global digital medicine market is expected to reach more than 500 billion US dollars by the end of 2025 and is growing at a compound rate. annual growth rate. 30% [1]. The "digitization" of medical information began long ago with the introduction of computers. The databases store and manage various. Thyroid cancer is the most common cancer. The incidence of thyroid cancer has continuously increased in several countries of the world in recent decades [2]. In 2015, 3,528 new case of thyroid cancer were diagnosed in the UK and the incidence is projected to increase by 74% between 2014 and 2035; this corresponds to 11 cases per 100,000 people (3).

The term artificial intelligence (AI) was first coined in 1956 by John McCarthy, who used his work on neural networks to enhance the direction of the field.1 AI reflects the intelligence involved in machines, which differs from the true understanding of living organisms. like people and animals The current definition of artificial intelligence revolves around the development of expert systems that use complex algorithms that, combined with high computing power, can think, learn, analyze and make decisions in complex situations.1In another article titled "Regulation of Thyroid Function During Pregnancy: Pathways of Adaptation of Endocrine Systems from Physiology to Pathology," the author noted that "our understanding of the complex relationship between pregnancy and thyroid function has advanced significantly in recent years" and that "the assumption that pregnancy-related thyroid changes were generally considered to be minor, was

far from the truth" (4). In recent years, much new information has been obtained about thyroid function and pregnancy, especially on topics such as the validity of thyroid function tests (10), the role of screening (11), autoimmune disease (AITD) .and treatment of pregnant women with thyroid disorders (4).

DATA MARKS OF COMPETING DISEASES

Through the effective management and systematic analysis of medical big data, information and communication technologies have developed web-based platform for the collection, standardization and storage of disease-related information at national or global levels. Such platforms allow patients and physicians to access integrated patient data without time or geographic constraints, and researchers can easily analyze high-quality, real-world big data. Cancer care is the best example of this phenomenon, as clinics and hospitals generate massive amounts of data in EHRs, and big data systems can combine this data with published literature findings using algorithms to provide better management guidelines (5).

METHODS

From January 1999 to April 2019, eight electronic databases were searched for studies that included HRQoL assessment in thyroid cancer patients. Utility ratings from multiple sources (EuroQol Questionnaire 5-Dimensional (EQ-5D), time mediation [TTO] and standard gambling methods [SG]) were extracted. In addition, utility estimates were generated by mapping the SF-36 and EORTC QLQ-30 to the EQ-5D-3L UK value set using published mapping algorithms. This systematic review follows the Center for Review and Dissemination (CRD) guidelines for systematic reviews in healthcare (6).

1. IMAGE ANALYSIS with AI/ML

The rapid growth of information technology has paved the way for the development of innovative technologies that exceed human capabilities in certain areas, such as artificial intelligence and ML. In general, artificial intelligence can be understood as the use of machines to imitate human cognitive functions, including learning and problem solving. Academically, artificial intelligence is the study of intelligent agents that can recognize the complexity of the environment and maximize opportunities to achieve their goals .ML is a branch of artificial intelligence that studies algorithms and statistical models that allow computer systems to improve their performance in a given task through experience without special programming (7). In the field of medicine, AI/ML is most actively applied in the analysis of medical images. AI/ML techniques can accurately interpret digitized medical images, providing information that doctors can use to make computer-aided diagnosis (CAD).

2. ANALYSIS of AI/ ML

If thyroid malignancy is suspected on US images, fine needle aspiration (FNA) is recommended (8). FNA is relatively simple, minimally invasive, painless, inexpensive and highly accurate. Cytopathologists examine FNA specimens under a microscope and make decisions based on their knowledge and experience. Therefore, diagnoses based on FNA cytology are subjective and subject to interobserver variability.

3. PROTOCOL AND REGISTRATION

The study protocol was based on the Scoping Reviews Extension of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA-ScR). The technique containstwenty essential and two additional parts that allow researchers to structure their research analysis. This process required checking the technique with all available factors. The strategy involved both initial discussion and review of the approach with all authors, which allowed for appropriate tools to be included in the study. The revision of the projection and the full text was done by two authors. If conflicts arose, the conflict was resolved by a third independent author (9).

4. ELIGIBILITY CRITERIA

Appropriate eligibility criteria have been defined. Documents meeting the inclusion criteria were articles published between 2017 and 2022. The inclusion of recent articles ensured the relevance of the collected data to the study, as older documents are likely to contain outdated information. The authors included only peer-reviewed articles to ensure data and accuracy. The main focus of all the publications included in this study was on efficiency based on artificial intelligence (10).

5. INFORMATION SOURCES

PubMed, Cochrane and EMBASE databases and Google Scholar search engines were used to obtain information. A literature searches of PubMed, Cochrane and EMBASE was conducted on August 7 and 8, while a Google Scholar search was conducted on August 9, 2022. Keywords used in the search engines and database were “artificial intelligence,” AI", "thyroid". surgery," "thyroidectomy," "thyroid," "artificial intelligence in thyroid surgery," "thyroidectomy," "thyroid," "artificial intelligence in thyroid surgery," and "developing artificial intelligence in thyroid surgery."(11).

6. SELECTION OF SOURCES OF PROOF

Once individual articles were generated from the search, the authors reviewed them. We presented the main arguments of each article and discussed their findings and relevance to the research objective as part of the screening process. The final articles of the study were selected in collaboration with all participating authors. Specifically, we scanned abstracts and full texts in pairs to determine their relevance. Whenever we encountered misunderstandings, other authors were asked for agreement (12).

7. DATA MAPPING PROCESS

We developed a data mapping form for the study. The document contained the data to be extracted from each article, including study characteristics, AI characteristics, evaluation data, and key findings from the literature review. Two authors independently mapped and extracted data, and a third author resolved any discrepancies. During this process, the possibility of misinterpretation of data was low and we only included articles suitable for the study (13).

8. INFORMATION OBJECTS

Important characteristics of actors and AI models and systems were extracted. Study country, study design, type of AI used in each study, and size of training and test databases were recorded. The extracted results were the most important conclusions of the study and the evaluation metrics used in the evaluation of artificial intelligence. The evaluation metric applied depended on each study. The sought variables depended on the application of artificial intelligence in different contexts.

CONCLUSION

Throughout human history, medicine has always evolved with the introduction of new technologies. Stethoscopes, electrocardiography, X-rays, US, computed tomography and magnetic resonance imaging are also the result of the recent application of technology in medicine and have led to significant advances in medicine. Digital medicine reflects a different approach to the adoption of new technologies, but with the difference that it can be more patient and has the potential to affect the entire field of medicine in the future. Although digital medicine is still in its very early stages and surrounded by many uncertainties such as privacy, security and cost-effectiveness concerns, it has already had an impact on the thyroid field, as discussed above. We encourage thyroid specialists to participate in this emerging field of medicine and apply it in practice, research and education to advance patient health and well-being (14).

REFRENCE

[1] Global Market Insights. Digital Health Market Size By Technology [Tele-healthcare {Telecare (Activity Monitoring, Remote Medication Management), Telehealth (LTC Monitoring, Video Consultation)}, mHealth {Wearables (BP Monitors, Glucose Meter, Pulse Oximeter, Sleep Apnea Monitors, Neurological Monitors), Apps (Medical, Fitness)}, Health Analytics, Digital Health System (EHR, e-prescribing System)], Industry Analysis Report, Regional Outlook (U.S., Canada, Germany, UK, France, Spain, Italy, Russia, Poland, China, India, Japan, Australia, Brazil, Mexico, South Africa), Application Potential, Price Trends, Competitive Market Share & Forecast, 2019-2025 [Internet]. Digital Health Market Report 2019. Selbyville: Global Market Insights, Inc.; 2019. [cited 2019 May 26]. Available from: https://www.gminsights.com/industry-analysis/digital-health-market. [Google Scholar]

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