عنوان مقاله:

eCOVID-۱۹: Development of ontology-based clinical decision support system for COVID-۱۹

محل انتشار:

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خلاصه مقاله:

Introduction: Humankind is passing through a period of significant instability and a worldwide health catastrophe that has never been seen before. COVID-۱۹ spread over the world at an unprecedented rate. In this context, we undertook a rapid research project in the Sultanate of Oman. We developed ecovid۱۹ application, an ontology-based clinical decision support system (CDSS) with teleconference capability for easy, fast diagnosis and treatment for primary health centers/Satellite Clinics of the Royal Oman Police (ROP) of Sultanate of Oman.Material and Methods: The domain knowledge and clinical guidelines are represented using ontology. Ontology is one of the most powerful methods for formally encoding medical knowledge. The primary data was from the ROP hospital's medical team, while the secondary data came from articles published in reputable journals. The application includes a COVID-۱۹ Symptom checker for the public users with a text interface and an AI-based voice interface and is available in English and Arabic. Based on the given information, the symptom checker provides recommendations to the user. The suspected cases will be directed to the nearby clinic if the risk of infection is high. Based on the patient's current medical condition in the clinic, the CDSS will make suitable suggestions to triage staff, doctors, radiologists, and lab technicians on procedures and medicines. We used Teachable Machine to create a TensorFlow model for the analysis of X-rays. Our CDSS also has a WebRTC (Web Real-Time Communication system) based teleconferencing option for communicating with expert clinicians if the patient develops difficulties or if expert opinion is requested.Results: The ROP hospital's specialized doctors tested our CDSS, and the user interfaces were changed based on their suggestions and recommendations. The team put numerous types of test cases to assess the clinical efficacy. Precision, sensitivity (recall), specificity, and accuracy were adequate in predicting the various categories of patient instances.Conclusion: The proposed CDSS has the potential to significantly improve the quality of care provided to .Oman's citizens. It can also be tailored to fit other terrifying pandemics

کلمات کلیدی:
COVID-۱۹, CDSS, Teleconferencing, AI-Based X-Ray Analysis, Ontology