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Atechnologicalaidtohomoeopathythatcanimprovethehomoeopathicprescription.

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ABSTRACTINTRODUCTIO

N

A"chatbot"is"acomputerprogramorcharacter(asinagame)designedtomimictheactions of a person to converse with human beings" being utilised in various industries,including business, e-commerce, education, entertainment, and health, as well as tomimichumaninteractionandappeasepeople.Inthemedicalindustry,chatbotsearlierwer eprimarilyusedforsolvingqueriesrelatedtohealth;foreitherfindingthecorrectdiagnosis or getting guidance correlating to the treatment. Now, these have transformedto be multilingual, apt for assessing the severity of the illness, recommending aphysician, follow-up checks, support with prescriptions and dispensing completeguidancefordietaryandlifestylechanges.

CHATBOTINHEALTHCARE

Numerouschatbotshavebeendesignedbyvariouscountries,aroundtheglobe,duringthe COVID-19 pandemic, to safeguard their population against coronavirus infections.The foremost benefit of a medical chatbot is that it answers patients' medical difficultiesinachatanddeliversapersonalizedrecommendationbasedonthesymptoms.

APPLICATIONSOFAIINTHEHOMOEOPATHICFIELD

In Homoeopathy, AI has been employed in many ways including fuzzy expert systemsandTheSystemforHomeopathicGlaucomaTreatment(SEHO)expertsystems(E S)tochoosethebestapproachfortreatingvisualdisorders.KENBO,atrueES,recordsthe complete symptoms of the patients and converts them immediately into rubrics fromfive available repertories. Vithoulkas Expert System, Anne Herscu Module, PaulOrtega Miasmatic Module, and Polarity Analysis are the various modules for caseanalysisinRADAROpuswhichalsoworksonthelineofAI.

CONCLUSION

The fundamentals, of the patient’s own words and emotions, have the maximumimportance. This, if collaborated with technology, can reduce the physician's bias ofinterpretation to a great extent. Therefore, the need of the hour is to develop such a toolfor homoeopathy, which can serve as a chatbot related to a particular repertory, andthen,withhelpofmachinelearningorAI,cananalysebythemselvesthevarioussignsan d symptoms to be addressed, as described by the patient, and can then define orprescribe a simillimum for the patient or can aid the physician by providing him with asetoffewremedieswhichcan,inturn,bethesimillimumforthepatient.

Keywords:homeopathy,repertory,chatbot,AI

Chatbot – A technological aid to homoeopathy that can improve the homoeopathicprescription.

INTRODUCTION

Computers provide factual details that allure and benefit in many ways. According to Merriam-Webster, a "chatbot" is "a computer program or character (as in a game) designed to mimic theactions of a person to converse with human beings." A chatbot is a program designed tosimulate intelligent conversation in a text or speech. These systems can learn on their own andrecover their learning using human aid or web resources. It uses Natural Language Processing(NLP) and sentiment analysis to communicate in human language with users or other chatbotsvia text or voice. The question-and-answer-based protocol is infrequently used in a chatbot foruser queries. The "artificial intelligence" (AI) term is applied when a machine imitates"cognitive" functions such as "learning" and "problem-solving" that are associated with humanminds. This gives the computer/program the supreme power to emulate the human way ofthinkingandbehaving.

CHATBOTINHEALTHCARE

Chatbots are primarily text-driven. They possess iconography and comprehensible widgets thatsimplifiestheinteractionwithabotsimple.Chatbotsarebeingutilisedinvariousindustries,including business, e-commerce, education, entertainment, and health, as well as to mimichumaninteractionandappeasepeople[1].Thecurrente-healthcarestructureentailsacomplexinteractionwithhumansandmachines.Analternativechatinterfacetoactandcommunicatewithpatientsasiftheywerehumans,shouldbeconfiguredanddeveloped.

Chatbots are classified into two types based on how they respond: non-intelligent andintelligentchatbots.Thosethatusepredefinedhuman-writtendialogueflowsare non-intelligent whereas intelligent AI chatbots use machine learning or NLP [2]. Rule-based chatbotsprimarilycountonlinguisticrulesandpattern-matchingtechniquestodeterminatelearningsand responses and operate algorithms that either are manually created or precedent as decision-makers. The disadvantage of these chatbots is that they are domain dependent. They rely onmanually devised rules for respective domains and so are duly rigid. In addition, they are brittle,extremely domain-specific, and difficult to apply to different problems. Chatbots run by AI usemachine learning algorithms. They reciprocate based on the data supplied and constantlycomprehend and enhance the extant learning models. Before 2010, rule-based chatbotsdominatedthemarketwhichthenwasreplacedbyAI-basedchatbotsasadvancedtechnologystarted to gain ground. [3,4] In the medical industry, until lately, chatbots were primarily used forqueries related to health, where different concerns and circumstances are submitted, for eitherfinding the correct diagnosis or getting guidance correlating to the treatment. Their conditionsarepredictedbasedontheirclinicalsymptomsbasedonmatchingthesymptoms.Now,th

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modelshavetransformedandtheseexistingchatbotshaveevolvedtobemultilingual,aptforassessing the severity of the illness, recommending a physician, follow-up checks, support withprescriptionsand dispensing completeguidancefor dietary andlifestylechanges.Thealgorithm maintains records of previous responses and progressively analyse with more in-depthquestionstomakeanaccuratediagnosis.[5–8]

Chatbotshelptoassessthehealthconditionbysimplydocumentingtheindicationsortestingof an ECG. It allows the user to extrapolate the question. They can even test the solutionprovided with the prescribed uses and therapeutic composition. It helps them to decide onmeasures for appropriate care with the analysis from artificial intelligence. An idea wasproposed where the AI could predict diseases based on the symptoms and provide the index ofavailable treatments. Periodically, if a person's body is analyzed, it is possible to anticipate anypotentialthreatevenbeforetheyinitiateanydamagetothebody.[9]

The chatbot device performs simple diagnoses on diabetic patients and acts as a virtual diabetesdoctor.ThechatbotusestheparametercalledVpathtorecallthepriordialoguethatcorresponds withthewholediscussionfordiagnosesasavirtualdiabetesdoctor.[10]

This chatbot aims to make a conversation between humans and machines. Here the systemstores the knowledge database to identify the sentence and make a decision to answer thequestion.Theinputsentencewillgetthesimilarityscoreofinputsentencesusingbigram.Thechatbotknowledgeisstoredin RelationalDatabaseManagementSystem.[11]

Theforemostbenefitofamedicalchatbotisthatitanswerspatients'medicaldifficultiesinachat and delivers a personalized recommendation based on the symptoms. The Chatbot isdevised to convey medication as an age-dependent pharmaceutical dosage for the patient. Adedicated device to answer all medication queries is designed. Effective Illness DiagnosisBased on Symptoms is simple to operate for a safer presence established on feedback andlearning[2].

Numerous chatbots have been designed by various countries, around the globe, during theCOVID-19 pandemic, to safeguard their population against coronavirus infections. Theseaddressed various issues like complaints and symptom analysis, some spread the word forprevention, and a few like the WHO nCOV-19 Launched Bot updated the daily cases for freshnew cases, recovered cases and those also who succumbed to death. In India, the Aarogya Setuapplicationwasdesignedtoboostawarenessofn COV-19withthehelpofachatbot[12]

APPLICATIONSOFAIINTHEHOMOEOPATHICFIELD

In Homoeopathy, AI has been employed in many ways including fuzzy expert systems and TheSystem for Homeopathic Glaucoma Treatment (SEHO) expert systems (ES) to choose the bestapproach for treating a visual disorder. [13] ES provides information about potentially lesseffective medications and the patient's symptoms that an individual physician would treat. TheprototypesystemhasusableBrailleadaptionsfortheutilizationofESbyblindpeople.[14]

HomoeopathicESwasdesignedusingneuralnetwork-basedtechnologyandconcepttheorywhichcouldalsodiagnoseapatientbasedontheirguidingsymptoms.Itcoulddeterminethehomoeopathicmedicationforpatientswithallergicillnessesandsyndromes.[15,16]

KENBO, a true ES, records the complete symptoms of the patients and converts themimmediately into rubrics from five available repertories. [17] It determines the dominant symptomofthecaseandaccordinglyproposesthereportorialapproach.Itdeterminesfromoneamong Kent's approach, Boeninghausen's-Boger's approach, and Regional approach. Then thesimillimum for the case is proposed established on the results of repertorization, the dominanceofmiasm,theconstitutionoftheindividualandtheaffinityofthepotentialdrug.Alongwiththe simillimum, its corresponding potency and repetition are also suggested. The ES alsoinvolvesinthedecisionforthesecondprescriptionaccordingtoKent's12ObservationsandHering'sLawofCure.

Withpolarityanalysis,advanceddevelopmentinBoenninghausen'sconceptofcontraindications was verified and introduced. This delivers a more accurate possibility ofsimillimumbytheprocessofrepertorisation.Coupledwithvariouschecklistsandquestionnaires, there was an increase in simillimum by 22% in acute diseases and 16% inchronicdiseases.Anaverageimprovementrateof9%wasobservedinchronicdisease.[18]

A modern epidemiological tool for defining the keynote symptoms of medicine is theLikelihoodratio(LR)whichcalculatesthepriorandposteriorprobabilityoftheeffectivityofmedicineinpresenceofacertainsymptom.LRandstatisticalprobabilitiesmaynoteliminatebutcanstillminimizebiasandmayvalidaterubricsandmedicinesinanyparticularrepertory.

When an analysis of 2039 prescriptions was done for thermal relations with 4715 fordesires/aversions for specific food items it was observed that a single patient might have adesire/aversion for multiple food items. But on the contrary, a comparison with Kent'srepertoryrevealeddiscrepancies.Thishasledtoinitiativesforrefiningandstandardizingthehomoeopathicliterature.AnewtaskformodifyingKent'sandBoenninghausen'srepertorieshas begunbyintroducingLRandpolarityanalysis.[19–21]

RADAROPUS, the most extensively used Knowledge-Based Expert System in the field ofhomoeopathy, is focused on the simillimum selection and includes four-way deductionapproaches for rating homoeopathic medications. It encompasses multiple features likedifferent rubric-analysis methods, quick reference remedy keynote, a database option for apersonal materia medica collection, and the ability to extract information about a drug. ThisKBES is rapid and flexible. [22,23] The recent introduction of Encyclopaedia Homeopathica (EN),deliverscomprehensiveliteratureofvariedsourcesofbooksandmateriamedicaalongwitha"help"sectionforquickandassistedinformation.VithoulkasExpertSystem,FamilyFinder,AnneHerscuModule,PaulOrtegaMiasmaticModule,PolarityAnalysisEnergeticRemedyPicture are the various modules for case analysis is another unique feature of RADAROpuswhichalsoworksonthelineofAI.[24]

The simillimum via repertorization always is based on the choice of rubrics selected in anyparticular case. The rubrics contain expressions which can be regarded as fuzzy, such as‘never’,‘sometimes’,‘always’,etc.,causingdifficultyindealingwithtraditionalcomputational approaches. There is a necessity for a decision tree system for selecting thesimillimuminHomoeopathyaidedwiththeapplicationofaFuzzyExpertSystem.Fuzzysettheo ryinexpertsystemsisanintriguingroutetohandletheillustrationofinaccuratemedicalentities. It downsizes the sensitivity of the system to the mistakes that a homoeopath makesandincreasesthesecurityofthesystem.Withtheemphasislaidonthetermsandexpressionso fthepatientinHomoeopathymakingitverysensitive,afuzzyexpertsystemfortheproperselection ofremedyisproposed.[25,26]

Ahomoeopathicmedicaldiagnosissystemusingmulti-agentsystem(MAS)technologyhasbeensuggestedwhereinthepatient'ssymptomsaremonitored andanalysedtodeterminethediseaseandthencreateafittingprescriptionforeachpatient.[27]

Usingtheconceptofaninternal"engine"thatcanaccessthecases,theirrepertorization,andthepres cribedmedicationsanongoingdynamicmateriamedicaandadynamicrepertorythatcan be constantly built and shaped from the wealth of clinical information that is readilyavailable online is proposed which can enhance the success of simillimum prescription andcure/reliefrates.[28]

CONCLUSION

Theworkdoneherewithinthefieldofchatbotsinthehealthcaresectordoescertainlypaveaway for its application in the field of alternative medicine of Homoeopathy. There has beennumerous research indicative of the change and upliftment of the homoeopathic repertory whileworkinghandinhandwithAIandtechnology.Despiteallthisthemaincoreofhomoeopathyli esinitspatients.Thebasicfundamentals,ofthepatient’sownwordsandemotions,havethemaximu m importance. This, if collaborated with technology, can reduce the physician's bias ofinterpretationtoagreatextent.Therightinterpretationoftheword,feelingsandemotionsisamust andthatcanbebestexplainedbytheonesuffering.Therefore,theneedofthehouristodevelop such a tool for homoeopathy, which can serve as a chatbot related to a particularrepertory, and then, with help of machine learning or AI, can analyse by themselves the varioussigns and symptoms to be addressed, as described by the patient, and can then define orprescribeasimillimumforthepatientorcanaidthephysicianbyprovidinghimwithasetoffewre medieswhichcan,inturn,bethesimillimumforthepatient.

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