EDITORIAL

Applied Artificial Intelligence for Tobacco Cessation in the Era of COVID-19: A Perspective

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Abstract

COVID-19 has affected many health services including Tobacco cessation measures. To continue with the strategies used for the de-addiction of tobacco, we need to adapt to the changing times. The use of Artificial Intelligence will help dental health care professionals to reach a larger population, effectively implement measures for tobacco cessation, and meticulous follow-up of patients.

Keywords: Artificial intelligence- tobacco cessation- COVID-19

In India,13% of deaths are believed to be caused due to the use of tobacco. It remains the major preventable cause of disease and death (Shimkhada and Peabody, 2003). Tobacco related diseases take a major toll on direct and indirect health costs in India and worldwide (Jha et al., 2008). Currently tobacco cessation programs are being taken very seriously under the National Tobacco Control Program in India. Multiple approaches are being tried at multiple levels. As tobacco use and associated diseases are a magnitude of problems with manifold layers, the measures need to be taken right from the production, distribution, advertising, consumption of tobacco and dealing with addiction and related diseases. Being health care providers, it is the duty of dental professionals to promote and help the patients for tobacco cessation.

The Coronavirus Disease 2019 (COVID-19) pandemic and overall disturbance caused due to it has forced the Oral diagnosticians to think of tobacco cessation beyond routine measures. The increasing evidence of association between smoking and progression of COVID-19 can be used to an advantage to motivate and promote tobacco cessation in the population (Zhao et al., 2020). In the current scenario where the patients already enrolled for tobacco cessation or potential patients for tobacco cessation cannot access dental institutions and clinics need to tackled with higher intelligence.

Artificial Intelligence (AI) is defined as a field of science and engineering concerned with the computational understanding of what is commonly called intelligent behaviour, and with the creation of artifacts that exhibit such behaviour (Shapiro, 1992). Today AI is used in various fields of Medicine and Dentistry. In the dental field, it is now used from basic patient data software applications to complex procedures in the specialities

of Orthodontics, Prosthodontics, Implant planning, Forensics and even Bioprinting (Khanna and Dhaimade, 2017). Applied AI can also be used for tobacco cessation in many ways.

Applied AI for smoking cessation mainly comprises of use of novel machine learning systems. A study conducted by Sadasivam et al., (2016) suggests that a few basic messages through Computer tailored health communication (CTHC) sent by AI or computers are definitely better than no messages to participants. They also used newly designed CTHC system-Patient Experience recommender System for Persuasive Communication Tailoring (PERSPeCT) which sent personalized messages regarding benefits of quitting and behavioural training. This proved more useful for tobacco quitting than sending basic or generic messages. As per Meyer et al., (2016) too, computer-based tailoring of counselling letters is identical to CTHC and helpful for intervention in smoking reduction. AI powered CTHC automated systems were utilized in Australia in by Balmford et al., (2013). The QuitCoach system sent tailored messages to more than 30,000 smokers. Personalized messages, automated and multiple interventions were popular and more effective than common messages and non-interactive systems and information. Rijhwani et al., (2020) assessed the applicability of Data Mining and Predictive Analysis for tobacco cessation. Data mining tool WEKA was used to classify the data obtained from patients from tobacco cessation clinic. It was evaluated using 10-fold cross-validations. 20 different attributes were considered for prediction of quit status. Using such tools improves patient outcomes and identifies a combination of variables for effective intervention of tobacco cessation. Similarly, Wang et al., (2019) effectively used machine learning

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approach to identify the smoking status in an online smoking cessation community by mining user-generated content. The quit status of candidates can be predicted using a machine-learning approach by entering significant measures as candidate variables (Coughlin and Sheffer, 2020). In the simplest versions, social media platforms like Twitter can be used to an extent for public health surveillance applications. It is used to assess tobacco related posts, sentiments and view of general population on emerging tobacco products (Myslin et al., 2013). Considering the rise of use of e-cigarettes in adolescents, an AI based mobile application with virtual 3D young character was developed for interactive communication for awareness and promotion of tobacco cessation amongst them (Santos et al., 2020). Moreover, the power of AI and machine learning can be utilized for behaviour change in candidates. The Human Behaviour-Change Project synthesized, interpreted and delivered evidence on behaviour change interventions which was up-to-date and customized to user needs and content (Michie et al., 2017). Afterall, behaviour change remains the key of tobacco de-addiction in many cases. Kamal and Kumari (2020) too reiterated the importance of AI and Machine Learning Algorithms (ML) for Cancer research during the pandemic. ML is a subset of AI which helps in simplifying complex databases, allowing better interaction with the subjects facilitating early diagnosis, drug discovery, available healthcare facilities and treatment outcomes. Patil et al., (2020) specified in detail about the role of AI, advanced Machine Learning and deep learning in various types of cancers and in various aspects of Oncology.

AI and associated applications seem to be promising in the field of tobacco cessation considering the availability of smart phones, internet access, interactive interventions and customisable options. It may also prove efficacious for the follow-up of tobacco cessation clinic patients undergoing treatment of premalignant diseases associated with tobacco use. The number of studies conducted on applied AI for tobacco cessation are still less and thus its applicability needs to be explored on a larger scale. Although no technology can mimic the complex functioning and intelligence of human brain, AI can be utilized for the noble cause of tobacco cessation and social uplifting.

Author Contribution Statement

Dr. Mrinal: concept, literature search, manuscript writing, editing; Dr.Anagha: literature search, manuscript writing, editing.

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