

Chatbots to stop smoking: is this the future?

Un chatbot para dejar de fumar. ¿Será el futuro?

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Information and communication technologies (ICTs) and their applications in different fields, including medicine, are part of our everyday lives. The use of ICTs (telemedicine, gamification and mobile applications) is moving the conventional healthcare model forward and has already been employed in helping to quit smoking and promoting healthy life changes (Segrelles-Calvo, Escribano-Gimeno, Llopis-Pastor, Pérez-Gallán & de Granda-Orive, 2018). The use of chatbots (CHB), originally defined as *a program which makes a certain type of natural language conversation between man and computer possible* (Weizenbaum, 1966), has recently been introduced in healthcare. The value of CHB in a health setting is given by a series of characteristics acting as technical enablers: an amazing combination of immediacy (rapid response) and asynchrony (notifications and reminders), rapid use (usability), anonymity (when interacting with the machine, patients may feel less embarrassed and show their feelings), authentication (they can safely protect themselves), personalization, scalability (they can target large audiences profitably), monitoring (understanding habits is a first step in promoting healthy behaviour), acquiring knowledge (making commitment to change easier through understanding), affect (combining personality and emotional aspects in dialogues can increase satisfaction and commit-

ment), and behaviour (they may influence behaviour) (Pereira & Díaz, 2019).

CHB have already been applied in various medical fields. An example is the exploration by Vaidyam, Wisniewski, Halamka, Kashavan and Torous (2019) of the existing evidence regarding CHB in the field of psychiatry and its role in the screening, diagnosis, and treatment of mental illness. They found that CHB were particularly helpful in psycho-education and self-adherence, with CHB having a high satisfaction rate. Kretschmar, Tyroll, Pavarini, Manzini and Singh (2019) showed us that CHB could have great potential in helping people with mental issues, and may be seen as less stigmatizing than consultation support. Between 2014 and 2018, Pereira et al. (2019) analyzed health-related use of CHB regarding behavioural changes and found that the most active areas of use were primarily in mental and physical well-being and nutritional and metabolic disorders, with affect and knowledge being the human competences most sought by CHB to achieve behaviour change.

Could CHB thus help to quit smoking? Current evidence is scarce, but that which is available can highlight its potential effectiveness, focusing on: 1) Helping smokers to make progress in their stages of change: Almusharraf (2019) ran a CHB which used the motivational interview

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to get the smoker to move to the decision to quit, noting that the CHB really helped these subjects in their decision to advance the stage of change. 2) Helping smokers to quit: Simon, Krishnan-Sarin and Huang (2019) indicated the usefulness of CHB in promoting smoking cessation in adolescents/young people with low income. An interesting experience was reported by Folly, Riedo, Felder, Falomir-Pichastor and Desrichard (2016) who developed the program for the first version of *J'arrête de fumer* which sought to group *Facebook* communities of those willing to quit smoking on the same day. After six months, 13.5% of a total of 7,008 participants had stopped smoking. 3) Helping smokers to long-term abstinence: Dubosson, Schaer, Savioz and Schumacher (2017) developed a CHB (with motivating comments, information, and the ability to relate to users) to help them go beyond the relapse peak presented by these authors in earlier studies, observing that the CHB helped smokers to cope with craving and thus maintain abstinence over time. Perski, Crane, Beard and Brown (2019) aimed to compare whether a version of the *Smoke Free* app with a supportive CHB allowed for increased commitment and abstinence in the short term compared to the app without the CHB. The authors found that the CHB version of the app did increase commitment, leading to higher withdrawal rates, albeit with low follow-up rates.

Regarding the possible risks and limitations of CHB, Kretschmar et al. (2019) noted that their capacity to recreate human interaction and offer individualized treatment may currently be limited, and the authors even wondered whether CHB could actually harm patients – such harm is generally invisible if not specifically tracked, which adds ethical concerns to the discussion. The authors indicate possible solutions to these risks and limitations: CHB must respect privacy and ensure user security, be evidence-based and be as transparent as possible.

We know that a clinical trial, called “Dejalo bot” is currently underway (<https://clinicaltrials.gov/ct2/show/NCT03445507>), developed by the tobacco addiction group of the Madrid Primary Healthcare Society (SOMAMFYC) and designed to demonstrate the effectiveness of a conversational CHB to help quit smoking. We are eager to hear the results.

Now is the time to build, develop, and demonstrate the potential of CHB, as it appears that they could now be useful and effective in helping people to quit smoking. The current evidence is scarce but hopeful.

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