

CASE REPORT

Smoking Cessation by Integrating Behavioral Support, Pharmacotherapy, and Digitalised Health Education in a Dental Setup for Dual Nicotine Dependence: A Case Report

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ABSTRACT

Tobacco use remains a leading cause of preventable illness and mortality, with 1.18 billion smokers globally in 2020. This case report describes a multi-faceted intervention at a smoking cessation clinic for DS, a 43-year-old male content creator with a two-decade smoking history and recent vaping habits. His relapses, fueled by social pressures and job-related stress, highlight the need for personalized care. The intervention plan incorporated motivational interviewing (MI), behavioral support, pharmacotherapy, and digital health education to guide DS from contemplation to action, addressing both psychological and behavioral dependence. This holistic approach, combining technology with traditional methods, demonstrates the potential for improved cessation outcomes in a clinical dental setting. *Malaysian Journal of Medicine and Health Sciences* (2025) 21(6): 1-4. doi:10.47836/mjmhs.v21.i6.1374

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INTRODUCTION

Tobacco and Smoking

Tobacco use is a significant contributor to various diseases and health disorders globally. In 2020, the global smoking prevalence among adults was recorded at 32.6% for males and 6.5% for females. It was estimated that approximately 1.18 billion people (with a range of 0.94 to 1.47 billion) were regular tobacco smokers during that year (1).

On a global scale, smoking-related diseases account for around 3 million deaths annually, with projections suggesting an additional 10 million fatalities by 2030. In Malaysia, smoking prevalence has shown a slight decline over the years but remains high, particularly among males and specific demographic groups. Smoking-related illnesses have been a significant cause of preventable diseases and deaths in Malaysia for several decades. This trend is expected to persist, given the current patterns, including a plateau in adult smoking prevalence and only a slight reduction in adolescents' smoking rates over the past ten years.

Dual Smoker

The use of electronic cigarettes (e-cigarettes), commonly known as vaping, has surged significantly over the past decade. In 2018, for instance, 8 million adults in the USA alone reported vaping, primarily with the intention of quitting or reducing smoking. Locally, the 2023 Global Adult Tobacco Survey (GATS) Malaysia reveals that the introduction of vaping has not significantly decreased tobacco smoking rates or led smokers to fully transition to e-cigarettes. The national prevalence of current tobacco smoking showed only a modest decline, dropping from 23.1% in 2011 to 19% in 2023. However, the percentage of dual users—individuals who smoke both tobacco and use e-cigarettes—rose from 0.8% to 3.9% during the same period. Notably, the prevalence of vaping in Malaysia has increased dramatically, surging by 600% over the past 12 years.

Smoking Cessation in Dental Set-Up

Dental practitioners have a unique responsibility to support smoking cessation through detailed patient assessments and counseling, focusing on medical, dental, and social histories. They are well-placed to influence young individuals and highlight the immediate oral health effects of smoking, such as tooth staining and halitosis, as motivating factors. In Malaysia, dental faculties incorporate smoking cessation clinics into their curriculum, providing clinical training for

students at both undergraduate and postgraduate levels. Additionally, mQuit clinic and Dental Public Health Specialist Unit (DPHSU) offered by Ministry of Health Malaysia, includes smoking cessation components and accepts referrals for comprehensive support. The mQuit program, part of Malaysia's National Strategic Plan on Tobacco Control, offers free cessation services nationwide, enhancing accessibility for smokers seeking help.

Behavioral Support in Smoking Cessation

Behavioral support includes advice, counseling, and motivational activities to assist smoking cessation. Success often depends on addressing complex factors like motivation and an individual's Locus of Control—whether they perceive change as within their control (internal) or dictated by external factors (external). Combining behavioral interventions with pharmacotherapy improves quit rates, with tailored approaches yielding better outcomes (2).

Pharmacotherapy in Smoking Cessation

Pharmacotherapy reduces nicotine withdrawal and cravings through first-line options like Nicotine Replacement Therapy (NRT), bupropion, and varenicline (3). These medications, often combined with behavioral support, have shown higher success rates. Second-line options such as clonidine and nortriptyline may help when first-line treatments are ineffective.

Digitalized Health Education

Digitalized health education has transformed the delivery of health information by utilizing technology to provide personalized, scalable, and interactive learning experiences. Through mobile applications, websites, and virtual platforms, individuals can access real-time support, educational resources, and tailored interventions that enhance health literacy and behavior change (4). In the context of smoking cessation, these digital tools offer targeted guidance, motivation, and accessible support, complementing traditional methods to improve cessation outcomes. As digital tools continue to evolve, their integration into smoking cessation programs represents a significant advancement with great potential in public health efforts to reduce tobacco use and improve overall health outcomes (5).

CASE REPORT

This case report details a multi-interventional approach in managing dual nicotine dependence in DS, a 43-year-old male social media content creator and influencer, with concurrent smoking and vaping habits, presenting at the Preventive Dentistry and Smoking Cessation Clinic, Universiti Teknologi MARA in four visits in 2023. The patient reported a smoking history spanning over two decades, having started at age 20, and currently smokes 3-4 cigarettes per day. In 2020, he began vaping as a supplementary form of nicotine intake and now vapes

approximately 10 times daily. Despite previous cessation attempts, he has struggled with relapses due to stress and peer influence in his high-profile profession, which frequently exposes him to social smoking situations. The patient lives with his wife and two children, and aside from a history of kidney stones, he has no other known systemic health conditions. He is symptomatic attendee and his last dental examination was two years ago for extraction of his lower right premolar due to irreversible pulpitis.

Clinical Examination and Diagnostic Findings

Dental examination identified localized gingivitis especially on lower anterior and upper and lower posterior teeth, contributing to moderate gingival inflammation (Gingival Index, GI score: 2), characterized by redness, swelling, and occasional bleeding. The clinical evaluation revealed suboptimal oral hygiene, with a Simplified Oral Hygiene Index (OHI-S) score of 3.9 and a plaque score of 50.35%, indicating high plaque accumulation and inadequate plaque control. The patient brushes twice daily but lacks interdental cleaning practices.

A basic periodontal examination (BPE) revealed 4-5mm pockets in posterior areas, indicating early-stage periodontitis. Periodontal risk assessment (PRA) was also done to determine the patient's risk for further disease progression and potential tooth loss. The patient's PRA also highlighted modifiable risk factors. The periodontal risk was categorised as medium. The DMFT score is 4. Caries risk assessment (CRA) revealed a high caries risk for DS.

Smoking habit and history

Over the years, his smoking habit escalated to 12 cigarettes (Dunhill) a day, but he has recently reduced this to 3-4 cigarettes daily, supplemented by vaping since 2020. He uses a disposable vape (Volt Bar Switch 12,000, 5% nicotine), consuming about 500 puffs daily and favoring fruit flavors. Despite several quit attempts, including adopting a healthier lifestyle and the 'Cold Turkey' method in 2018, DS demonstrates significant nicotine dependence, with an FTND score of 6, a CO level of 9 ppm, and compromised oral health (plaque score: 50.35%). While he temporarily reduced smoking during the COVID-19 pandemic, his habit reverted to pre-pandemic levels, highlighting the challenges in sustaining cessation efforts.

Tobacco Use and Its Impact on Oral Health

DS's dual use of cigarettes and vaping poses challenges to his oral and systemic health. Smoking exacerbates periodontal disease by impairing vascular health and delaying healing, while vaping perpetuates inflammation and sustains nicotine dependence. As an influencer, peer pressure and social gatherings with smokers complicate his cessation efforts. Although aware of health risks, DS views vaping as a "less harmful" alternative, a

misconception influenced by online sources. Peer influence and easy access to cigarettes further hinder his quitting attempts. Despite some interest in cessation, DS remains ambivalent and has yet to engage in structured programs or use nicotine replacement therapies (NRTs).

DISCUSSION

Management of smoking cessation through behavioural support using motivational interviewing, stage of change framework, pharmacotherapy, and digital health interventions

Smoking cessation is inherently challenging, and this difficulty is exacerbated in environments where smoking is socially acceptable. Without support, the success rate of smoking cessation efforts remains discouragingly low, typically around 4%. Recognising this, the intervention strategy for DS involved a combination of MI, behavioural support, a pharmacotherapy approach and health education to address his misconceptions and enhance his understanding of the risks associated with risks associated with smoking and vaping.

Motivational Interviewing (MI) is a directive patient-centred counselling style designed to help people explore and resolve ambivalence about behaviour change. MI is a technique that prioritizes empathy over judgment, emphasising the patient's role in making behavioural changes rather than placing the burden on the doctor. MI at every visit was particularly crucial in navigating the stages of change, as it allowed for a patient-centred approach that respected DS's readiness to change. This approach proved effective in guiding DS from contemplation to preparation and eventually to action, where he significantly reduced his cigarette intake and made progress in reducing his vape usage. Additionally, the 5A's brief intervention strategy (Ask, Advise, Assess, Assist, Arrange) was implemented as part of the evidence-based guidelines for smoking cessation, ensuring that DS received continuous support tailored to his specific needs.

Assessing and exploring a patient's current readiness and stage of change is essential in selecting the most effective intervention. The stage of change model recognizes that individuals are at varying levels of motivational readiness to adopt health-related behaviours, and interventions are most effective when customized to align with a patient's specific stage of change. Integrating the stages of change model with MI is considered a practical approach for healthcare providers to behaviourally support patients in modifying unhealthy lifestyle behaviours. In DS's case, we observe a significant transition through the stages of change—from contemplation of quitting nicotine to preparation, and finally, to taking action in his last two visits, as summarised in Fig. 1.

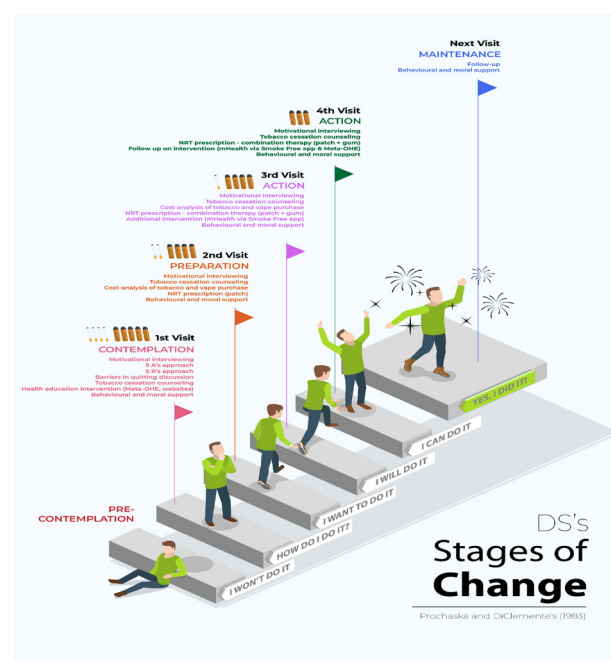


Fig. 1: DS's significant transition through the combination of stages of change and motivational interviewing

NRT aims to reduce cravings and withdrawal symptoms, with its efficacy well-documented. In this case, combination NRT therapy using Nicorette Transdermal Patches and Nicorette Gum was tailored to the patient's smoking history, FTND score, and CO levels. The patient started with Step 1 patches (25 mg) for eight weeks, transitioning to Step 2 (15 mg) for another eight weeks to gradually reduce nicotine dependence. Nicorette Gum (2-4 mg, as needed) was added to manage breakthrough cravings, with education provided on its proper use and potential side effects. Paired with MI and digital health interventions such as Meta-OHE, this approach proved effective. Initially, the patient smoked 3-4 cigarettes and vaped 500 puffs daily. By the most recent visit, he had achieved total abstinence from smoking and reduced vape usage to 350 puffs per day (equivalent to 23-35 cigarettes), demonstrating the success of this integrated strategy.

DS's smoking cessation plan effectively integrated innovative strategies, including the use of the immersive technologies such as Meta-OHE platform for oral health education to improve his health knowledge (<https://mitoworld.io/world/w/2808/meta-ohe>) and the Smoke-Free app (<https://smokefreeapp.com>) for personalized support for his smoking cessation plan. Behavioural support delivered via a smartphone can help smokers quit by providing constant access to motivational resources and progress tracking. In DS's case, the app was an integral part of his cessation plan, offering a level of convenience and immediacy that traditional methods

might lack. The integration of these innovative tools into DS's cessation plan not only provided him with the necessary support to reduce his nicotine intake but also offered a model for future smoking cessation efforts that could benefit from the combination of traditional and digital interventions.

The success seen in DS's reduction in cigarette use, daily vape puffs and exhaled CO level as shown in Fig. 2.



Fig. 2: The reduction of daily cigarette intake, vape puffs, and CO level from 1st to 4th visit

CONCLUSION

The combination therapy of behavioural support through MI, behavioural counselling, digital health intervention, combined with pharmacotherapy through consistent patient education and follow-up., was essential in addressing both the psychological and physical aspects of his addiction potentially effective in reducing nicotine intake. Healthcare professionals should be well-informed about these approaches, actively encourage use, and provide essential guidance and support to the patient. However, be mindful that it is crucial not to overlook the social determinants of health when addressing patients in clinical settings, as these factors can significantly influence management and treatment outcomes.

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