

# Unravelling the effect of a Dental Public Health Intervention (ISAC)

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# Summary

Oral cancer is a serious public health issue that has a negative impact on individuals' quality of life in terms of physical impairments, facial disfigurement, and social and psychological issues. Tobacco use in all its forms is the most significant risk factor for oral cancer. The use of Shammah (a local type of smokeless tobacco) was found to be most strongly associated with an increased risk of developing oral cancer in Saudi Arabia. Most of the diagnosed cases of oral cancer in the country have been detected at the late stage (Stage IV), markedly worsening morbidity and mortality rates in the diagnosed patients. Among the contributing factors to the late detection of oral cancer, as revealed in several studies, was a lack of performing examinations and patient education among dentists. Dentists should be a key player in the early detection and prevention of the disease. However, at present, dentists are not systematically involved in these processes in Saudi Arabia. Thus, it is imperative to activate their role in examining for oral cancer and educating patients about the disease.

The fact that the Jazan region carries the heaviest burden of oral cancer (35% of the total diagnosed cases in Saudi Arabia), necessitates a novel collaborative multidisciplinary approach to appraise the problem thoroughly from every possible angle. Therefore, the primary aim of this thesis is to unravel the effect of a novel dental public health intervention on dentists' cognition and behavior towards complete oral cancer examinations and patient education, in order to enhance the early detection and prevention of oral cancer in the Jazan region. We first focused on identifying the psychosocial determinants of Shammah use due to the important influence they have on this high-risk behavior and their ability to be changed. The knowledge obtained from these determinants would provide targeted information crucial for Shammah cessation and prevention interventions. Thus, this thesis is the first to explore the psychosocial determinants of using a common type of smokeless tobacco (Shammah) that is highly associated with oral cancer in the Jazan region. Moreover, it reviews the scientific evidence about the common behavior-change techniques used in effective tobacco-cessation

interventions by oral health professionals. Furthermore, this thesis presents the final protocol of a comprehensive dental public health intervention for the early detection and prevention of oral cancer in the Jazan region. In addition to this, it explores dentists' perceptions and usability testing toward the implementation of the developed intervention in Jazan Dental School, Saudi Arabia. Finally, there is an evaluation of both the effect and the process of the intervention implementation in the Jazan Dental School, which is the first clinical implementation site at the current stage. In the next stages, the aim is to disseminate this approach to the other dental organizations across the country.

*Chapter 2* explores the psychosocial determinants associated with Shammah use among adults in the region of Jazan. To achieve this aim, we qualitatively analyzed the data obtained from interviewing 30 current Shammah users, informed by integrating the behavior-change theories the Reasoned Action Approach, the Socio-Cognitive theory and the I-Change model. The study revealed that Shammah use was associated with uncertainty about the composition of the substance and a lack of knowledge on how to quit, higher social acceptability, influence from family/friends, a range of positive and negative attitudinal beliefs toward its use and high quitting efficacy beliefs.

*Chapter 3* reviews the behavior-change techniques commonly used in behavioral-change interventions for tobacco cessation in dental settings and assesses its relationship with the intervention effects on tobacco cessation. There were sixteen BCTs coded using the BCT taxonomy of behavioral support for smoking cessation (BCTTsm). Tobacco-cessation interventions in the dental setting appear to benefit from using BCTs that increase motivation and teach regulatory skills.

*Chapter 4* presents the protocol of a novel intervention, called the ISAC method, which was developed to enhance the early detection and prevention of oral cancer in the Jazan region, and was guided by the Intervention Mapping approach. The ISAC intervention is based on four

activities meant to be performed by dentists: I=Inform the dental patient about oral cancer screening, S=Screen for oral cancer, A=Advise and educate the patient on oral cancer risk factors, including brief tobacco cessation counselling, and C=Connect high-risk patients with a suspicious lesion with specialized services, such as secondary/tertiary hospitals, and connect those who require advanced help to quit tobacco with tobacco-cessation services. The chapter also discusses the empirical and theoretical evidence underpinning the developed intervention.

**Chapter 5** explores dentists' perceptions and usability testing on the implementation of the ISAC intervention in their routine dental practices. To achieve this aim, we purposefully selected ten dentists and asked them to practice with the intervention while thinking aloud and performing follow-up interviews. The analysis was guided by the Fleuren framework for the determinants of an innovation's implementation within a healthcare setting. The study revealed favorable beliefs and expectations shared by the participants about the ISAC intervention and its ability to enhance the early detection and prevention of oral cancer. The inclusion of representatives from different relevant stakeholder groups in the conceptualization and the development of the ISAC intervention was highly valued by the participants. The chapter also reflects on the opportunities of intertwining intrinsic motivators in the target group. For example, intrinsic motivators like satisfaction and altruism can be combined with extrinsic motivators like giving a completion certificate to boost and sustain dentists' behavior change. The high visibility of short-term effects and the presence of inspirational role models also enhanced the participants' motivation to practice the intervention.

**Chapter 6** tests the potential effect of the ISAC intervention, as implemented in Jazan Dental School clinics, on dental interns' cognition and behavioral capabilities towards performing complete oral cancer examinations and educating patients. This was achieved by conducting a pretest-posttest repeated-measures study over a six-month period among 47 dental interns (all practicing in Jazan Dental School). The study used a triangulation of data sources

for data collection, observer checklists, patient questionnaires and coding video recordings of dental consultations. The study showed significant improvements in the dental interns' cognition and skills toward oral cancer examinations and patient education (tobacco cessation and patient communication). Furthermore, the study shows that the effect of the ISAC was the same for male and female dental interns.

**Chapter 7** provides insights into the implementation of the ISAC intervention in dental clinics (process evaluation). The study used a mixed methodology (both qualitative and quantitative data collection) to gather data about the Linnan and Steckler' evaluation framework components, in order to gain a deeper knowledge of how the ISAC intervention operated in practice. The tools used to assess the context, reach, dose delivered, dose received, fidelity, recruitment and satisfaction included a checklist, a questionnaire, semi-structured interview, focus group discussion, an attendance log sheet, and the ISAC website's analytics. The findings of the study showed that the intervention session attendance was high, and all participants received the three ISAC components. All participants engaged in the three intervention components and most of the participants used additional ISAC resources (e.g., published videos on taking biopsies). Participants reported a high level of satisfaction with the ISAC intervention, seeing many benefits and experiencing very few difficulties in applying the methods relating to oral cancer examinations and patient communication. As intended, participants reported that the ISAC increased their awareness of the problem of oral cancer, their role in prevention and early detection, as well as their ability to engage in complete oral cancer examinations and patient education.

Finally, **Chapter 8** discusses and reflects on the main findings reported in this thesis, general methodological considerations, and implications for practice and research.