

רפואת הפה והשיניים

עיתון ההסתדרות לרפואת שיניים בישראל THE JOURNAL OF THE ISRAEL DENTAL ASSOCIATION



Volume 37, no 3, July 2020

כרך ל"ז, גיליון מס' 3, אב תש"פ

Promoting toothpicks in fitness-sports centers may contribute to optimal oral self-care and a healthy lifestyle

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Introduction

Worldwide, still most common oral diseases, like caries, periodontal diseases and tooth erosion can be prevented by daily oral self-care, e.g. tooth brushing twice a day with a fluoride toothpaste including interdental cleaning, for example, the use of toothpicks, interdental brushes or floss and tongue cleaning (1-8). Tooth brushing could be seen as a habit behavior –as young as one is, he/she may or may not have received a tooth brush from his/her parents/caregivers– and start to adopt this tooth brushing behavior (9, 10). Even though tooth picking has been acknowledged as the oldest human habit related to oral hygiene (11), the additional use of wooden toothpicks in combination with tooth brushing has no significant effect on removing plaque, but improvement was found in inter-dental gingival inflammation (7), and most of the non – smoking systemically healthy young adults in a Dutch study never use woodsticks, interdental brushes or floss (12). The theory of habitual behavior (9), which can be seen as a supplement to the Theory of Planned Behavior, i.e., a theory, which focuses on the psychological factors that should be changed in order to change behaviour (1, 4, 5, 12), is implicitly applied in a so-

called Pick-a-T Public Campaign, to promote the use of toothpicks in restaurants, hotels and catering areas (13). If a certain additional task, such as interdental cleaning, is performed irregularly, people mostly weigh the pros and cons. Also, it is necessary for people to check if they think that they are capable of carrying out daily oral self-care (9). By promoting oral health and implement interventions by oral care professionals to make people aware of the importance of oral health in relation to their regular health (13) and how to prevent these oral diseases, a behavioral change is needed, but a behavioral change is often complex. People are not well-informed and if they are, they do not perform the appropriate behavior (14). On-going support is crucial to maintaining behavior change (9). In daily life activities, oral health may not only influence someone's regular health, it also has an impact on a range of activities and emotions without pain, discomfort, and diseases, like to speak, smile, smell, taste, touch, chew, swallow and convey (5,15). So, oral health is important for the well-being of all people, and in particular for (elite) athletes during their sport performances. Or rather, with a healthy mouth you can practice the sports of your choice without interruption or pain (16-19).

For instance, while Usain Bolt suffered a dental abscess during the 2016 Olympics, he ended his Olympic career with a triple gold appearance in Rio (18). Another example, due to an infected wisdom tooth, which had spread the infection throughout his body, British rower Alan Campbell had almost missed the 2008 Olympics (18). Scientific studies show that a majority of professional athletes have poor oral health and this directly affects their well-being, training and performances (16, 17, 19-21). Although previous findings have shown that promoting the use of toothpicks in hotels, restaurants and catering areas (HORECA), were promising in encouraging interdental oral self-care (13), the aim of this Pick-a-T study was to evaluate athletes' opinion in a Fitness-Sports Center about their oral health related to healthy lifestyle. Moreover, this pilot study was aimed to explore whether or not the availability of toothpicks in a catering area within a Fitness-Sports Center had an impact on athletes' lifestyle or interdental oral self-care.

Material and Methods

The pilot study was –with explicit permission of the owners– conducted in a Fitness-Sports Center at the Olympic Stadium in Amsterdam. More specific, in an in-house healthy brasserie and set up in collaboration with Oral-Vision, a dental hygiene clinic also housed within this Fitness-Sport Center. After permission of the owner and manager from the in-house healthy brasserie, the available regular cocktail picks-round and sharp-ended points- were replaced by professional toothpicks i.e., single wrapped wooden triangle toothpicks. On each table small boxes containing 50 toothpicks were distributed passively to the athletes. For three months, each day the number of toothpicks that were taken by the athletes was counted and replaced by the investigator. 40 participants completed a short questionnaire, which included 9 items about socio-demographics, like, age, and level of education. The athletes perceived oral health was valued by themselves by using a number ranging from: "0 =very poor

to 10 =extremely good perceived oralhealth" on the 'Ladder Scale' as the Self-Anchoring Striving Scale (22). They were also asked about oral health related to a healthy lifestyle, e.g. questions about visits to oral- health professionals and oral -health behavior, and if they used interdental cleaning aids, for instances, toothpicks, interdental brushes or floss. The questions were open-ended, multiple choice, or to be answered on bipolar adjective rating or Likert scales. Athletes participated on a voluntary basis, they were informed about what participation entailed, no pressure was placed and to complete this questionnaire took 20 minutes. Consistent with the guidelines of the ethical board Central Committee on Research Involving Human Subjects this pilot study, which requires filling in a questionnaire for one occasion, does not fall under the scope of Medical Research involving Human Subjects Act (23). Furthermore, the study was conducted in accordance with the Declaration of Helsinki, an extensive formal written informed consent was waived and thus only verbal informed consent was obtained. In addition, an e-mail address was requested whether the participants want to be informed about the study outcomes.

Results

Out of 40 athletes of the Fitness-Sports Center, two-thirds were men (N = 26; 65%). Their average age was 37.3 (SD= 15.2) years. Athletes' educational level was advanced vocational training (N = 17; 43%), up to higher professional education (N = 15; 38%) and university (N = 8; 20%). The athletes evaluated their perceived oral health as 'good', with a mean value of 8, on a scale of 0 to 10, (SD = 1.1). No less than two-thirds, 26 (63%) athletes reported not using a toothpick each day. More than a quarter of the athletes (N = 11; 27%), reported no attendance to a dental hygienist. Another 11 (27%) athletes had visited a dental hygienist once and 16 (40%) athletes had visited a dental hygienist twice a year. Most athletes (N = 36; 90%) evaluated the use of a toothpick after eating as (very) important for a fresh mouth feeling and optimal oral

health. A bit more than two-thirds 27 (68%) of the athletes evaluated the availability of toothpicks in the in-house healthy brasserie as (very) important.

Discussion

The aim of this third Pick-a-T study was to evaluate athletes' opinion in a Fitness-Sports Center about their oral health related to healthy lifestyle. In addition, this pilot study was aimed to implement the availability of toothpicks in a catering area in this Fitness-Sports Center and to explore whether or not it had an impact on athletes' lifestyle or interdental oral self-care. Although the athletes reported their oral health as good, they also indicated not to use toothpicks on a daily basis. Therefore, it was striking that most athletes reported a toothpick after eating as (very) important for a fresh mouth feeling and optimal oral health. A large part of the athletes also found the availability of toothpicks in the in-house healthy brasserie as (very) important. Interesting in this context is whether athletes' own oral health perception corresponds to the actual clinical oral health of the athletes. Research shows us that oral-health in (elite) athletes are very poor and that it has impact on the well-being, training and performances (16-21). Further research is needed and it is important to explore whether personal and lifestyle determinants of the (elite) athletes and their coaches are the same or different in various contexts. Collaboration and tailored interventions by dental hygienists at sports centers to promote oral health and to emphasize the relationship to regular health could contribute to a positive effect on the awareness of (elite) athletes and lead to behavioral change.

However, in the midst of the COVID-19 pandemic, some of the public and a lot of athletes are dealing with many uncertainties. They may struggle to manage their healthy (sports) lifestyle and deal with feelings of worry or fears about their daily circumstances and the future. In similar vein, oral diseases may have additional negative impact on both quality of life and the economy

worldwide. Nowadays, poor oral health has become a public health concern too. Given this new reality, the impact of the COVID-19 may affect the study outcomes. For the developing of a so called post COVID-19 oral health intervention tailored to athletes, the previous results might give an indication as to what could be focal points to promote visits to oral care facilities. Also more structured and tailored cooperation between oral health professionals, target groups, insurance and the government may lead to more central organised preventive oral health campaigns (12).

To conclude, the owners of the Fitness-Sports Center and of the in-house healthy brasserie, including the manager, were enthusiastic and positive about the outcomes of Pick-a-T study. They especially appreciated the collaboration with Oral-Vision, a dental hygiene clinic also housed in the same Fitness-Sport Center in Amsterdam. In addition, they are willing to contribute in promoting to awareness of the athletes about the oral health related to regular health. The replacing of the cocktail picks by professional toothpicks on the tables the in-house healthy brasserie is a first step to promote awareness by the athletes in this Fitness-Sports Center. Interventions to promote interdental cleaning, in line with Pick-a-T Public Campaign by professionals, are needed to promote oral self-care and a healthy (sports) lifestyle among the public and (elite) athletes.

Acknowledgment

Thanks to the owners of the Fitness-Sports Center at the Olympic Stadium in Amsterdam, including thanks to the owner and manager from the in-house healthy brasserie. Also thanks to Nora Löb and Stephany Thijssen. Finally, thanks to Sharon Friedman for her support, and many thanks to Shlomo Zusman for the best poster award 2017, honoring the Pick-a-T studies, at the Dental Public Health Nazareth Conference in Israel.

The single wrapped toothpicks were made available by Jordan®, Lilleborg International, Norway, and the boxes

of toothpicks with Aminfluoride were kindly supported by Colgate-Palmolive Nederland BV, Weesp, The Netherlands.

Conflict of interest

Both authors declare no competing interests.

References

1. Patel J, Kulkarni S, Doshi D, Reddy P, Buunk-Werkhoven, YAB. Determinants of oral hygiene behaviour among moderate and severe chronic periodontitis patients based on Theory of Planned Behavior. *Int Dent J*. 2019; 69(1):50-7.
2. Netty Suryanti, Armasastra Bahar, Anton Rahardjo, Ali Nina Liche Seniati, Diah Ayu Maharani. Validity and Reliability of the Indonesian Version of Oral Hygiene Behavior Index Questionnaire: A Cross Sectional Study among Young Adolescents in Junior High School in Bandung, Indonesia. *J Int Dent Med Res*. 2019; 12(2):633-639.
3. Al Maliky S, Hennequin Hoenderdoes NL, Slot DE, Van der Sluijs E, Keijser BJ, Van der Weijden GA. Oral hygiene behavior of a group healthy students. [Mondhygiënegedrag van een groep gezonde studenten]. *Ned Tijdschr Tandheelkd*. 2016; 123(6): 295-302.
4. Brein DJ, Fleenor TJ Jr, Kim SW, Krupat E. Using the Theory of Planned Behavior to identify predictors of oral hygiene: A collection of unique behaviors. *J Periodontol*. 2016; 87(3):312-9.
5. Buunk-Werkhoven YAB, Dijkstra A, Van der Schans CP. Determinants of oral hygiene behavior: A study based on the theory of planned behavior. *Community Dent Oral Epidemiol*. 2011;39(3):250-9.
6. Hoenderdos NL, Slot DE, Paraskevas S, Van der Weijden GA. The efficacy of woodsticks on plaque

Funding statement

No support from any organization for the submitted work; no financial relationships with any organizations that might have an interest in the submitted work in the previous 3 years; and no other relationships or activities that could appear to have influenced the submitted work.

- and gingival inflammation: a systematic review. *Int J Dent Hyg*. 2008; 6(4):280-9.
7. Sälzer Sonja, Slot Dagmar E, Van der Weijden Fridus, Dörfer Christof E. Efficacy of Inter dental mechanical plaque control in managing gingivitis – a meta review. *J Clin Periodontol*. 2015;42,S16:S92-105. doi: 10.1111/jcpe.12363.
8. Laura M. Van Gils, Dagmar E. Slot, Eveline Van der Sluijs, Nienke L. Hennequin Hoenderdos, Fridus (GA) Van der Weijden. Tongue coating in relationship to gender, plaque, gingivitis and tongue cleaning behaviour in systemically healthy young adults. *Int J Dent Hyg*. 2020 Feb;18(1):62-72. doi: 10.1111/idh.12416.
9. Verplanken B, Aarts H, van Knippenberg A, van Knippenberg C. Attitude versus general habit: Antecedents of travel mode choice. *J Applied Social Psych*. 1994; 24(4): 285–HYPERLINK "http://300.doi.org/10.1111/j,1559-1816" \t "_blank" 300.doi.org/10.1111/j,1559-1816, 1994. tb00583.x.
10. Buunk-Werkhoven, YAB, Burrekers, SY. Oral health awareness, promotion of home oral self-care, and professional oral health care among young mothers and their babies: a pilot project. *Oral Health Care* 2017, 2(5):1-4. doi: 10.15761/OHC.1000134.
11. Hlusko LJ. The oldest hominid habit? Experimental evidence for toothpicking with grass stalks. *Current Anthropology*.2003; 44:738–741.
12. Buunk-Werkhoven YAB. A model for developing

- theory-based and evidence-based health promotion programmes. European Association Dental Public Health (EADPH) Congress, 12-14 September 2019 in Ghent, Belgium. *Community Dent Health*. 2019; 37:65–82 [4306 p. S24.]
13. Buunk-Werkhoven YAB. Pick a T – Public Campaign to promote the use of toothpicks: a pilot study. *Adv Dent & Oral Health*. 2017; 4(5):555673. Doi10.19080/ADOH.2017.05.555673.
 14. Wade KJ, Coates DE, Gauld RD, Livingstone V, Cullinan MP. Oral hygiene behaviours and readiness to change using the Trans Theoretical Model (TTM). *N Z Dent J* 2013, 109(2):64-68.
 15. Glick Michael, Williams David.M, Kleinman Dushanka.V, Vujcic Marco, Watt Richard.G, Weyant Robert.J. A new definition for oral health developed by the FDI World Dental Federation opens the door to a universal definition of oral health. *Am J OrthodDentofacialOrthop*. 2017; 151(2):229-231. doi: 10.1016/j.ajodo.2016.11.010.
 16. Gallagher Julie, Ashley Paul, Petrie Aviva, Needleman Ian. Oral Health-Related Behaviours Reported by Elite and Professional. Athletes. *Br Dent J*. 2019;227(4):276-280. doi: 10.1038/s41415-019-0617-8.
 17. Gallagher J, Ashley P, Petrie A, Needleman I.Oral Health and Performance Impacts in Elite and Professional Athletes.*Community Dent Oral Epidemiol*. 2018; 46(6):563-568. Doi: 10.1111/cdoe.12392. Epub 2018 Jun 25.
 18. Kragt L, Moen MH, Van Den Hoogenband CR, Wolvius EB. Oral Health Among Dutch Elite Athletes Prior to Rio 2016. *Phys Sportsmed*. 2019;47(2):182-188. doi: 10.1080/00913847.2018.1546105. Epub 2018 Nov 25.
 19. Needleman I, Ashley P, Petrie A, Fortune F, Turner W, Jones J, Niggli J, Engebretsen L, Budgett R, Donos N, Clough T, Porter S. Oral Health and Impact on Performance of Athletes Participating in the London 2012 Olympic Games: A Cross-Sectional Study. *Br J Sports Med*. 2013;47(16):1054-8. doi: 10.1136/bjsports-2013-092891. Epub 2013 Sep 24.
 20. Needleman Ian, Ashley Paul, Meehan Lyndon, Petrie Aviva, Weiler Richard, McNally Steve, Ayer Chris, Hanna Rob, Hunt Ian, Kell Steven, Ridgewell Paul, Taylor Russell. Poor Oral Health Including Active Caries in 187 UK Professional Male Football Players: Clinical Dental Examination Performed by Dentists. *Br J Sports Med*. 2016;50(1):41-4. doi: 10.1136/bjsports-2015-094953. Epub 2015 Nov 2.
 21. Needleman I, Ashley P, Fine P, Haddad F, Loosemore M, de Medici A, Donos N, Newton T, van Someren K, Moazzez R, Jaques R, Hunter G, Khan K, Shimmin M, Brewer J, Meehan L, Mills S, Porter S. Consensus Statement: Oral Health and Elite Sport Performance. *Br Dent J*. 2014;217(10):587-90. doi: 10.1038/sj.bdj.2014.1000.
 22. Cantril H. *The pattern of human concerns*. Rutgers University Press, New Brunswick, USA, 1965.
 23. Committee on Research Involving Human Subjects (CCMO). Questionnaire research. [Internet]. Available from: <http://www.ccmo.nl/en/questionnaire-research>. Accessed 4 June 2019.

