Rapporteurs:
Alexia Larderet, Amélie Sarbacher, and Lina Tahour
with Pierre-Yves Gegout and Prof. Olivier Huck

Affiliation:
Postgraduate programme in periodontology,
University of Strasbourg, France

study

Healthy lifestyles mean better response to periodontal therapy

Authors:
Crystal Marruganti, Mario Romandini, Carlo Gaeta, Edoardo Ferrari Cagidiaco, Nicola Discepoli, Stefano Parrini, Filippo Graziani, Simone Grandini

Background

Health is defined as a complete state of mental, physical, and social wellbeing, and not merely the absence of disease. Whether people are healthy or not is influenced by their social and economic context, the physical environment, and individual characteristics and behaviours. Many combined factors significantly affect people's health, and this is notably the case with nutritional habits, physical inactivity, systemic conditions, smoking, and alcohol consumption.

People with healthy lifestyle behaviours have a high-quality diet, an adequate frequency of physical activity, and are non-smokers. They are associated with a lower risk of chronic and non-communicable diseases when compared to people with unhealthy lifestyles. Regarding gum disease, people with unhealthy lifestyle behaviours frequently report a higher prevalence of periodontitis with a more severe diagnosis, and the efficacy of the first two steps of periodontal therapy is negatively influenced.

Interventions for risk-factor control – smoking cessation, stress reduction, dietary counselling, weight loss, increased physical activity – educate and advise dental patients about behavioural changes that aim to prevent periodontitis and improve treatment outcomes. In specific cases, a multidisciplinary medical collaboration is necessary. However, there is a lack of evidence about whether these lifestyle interventions may provide an added benefit to periodontal therapy.
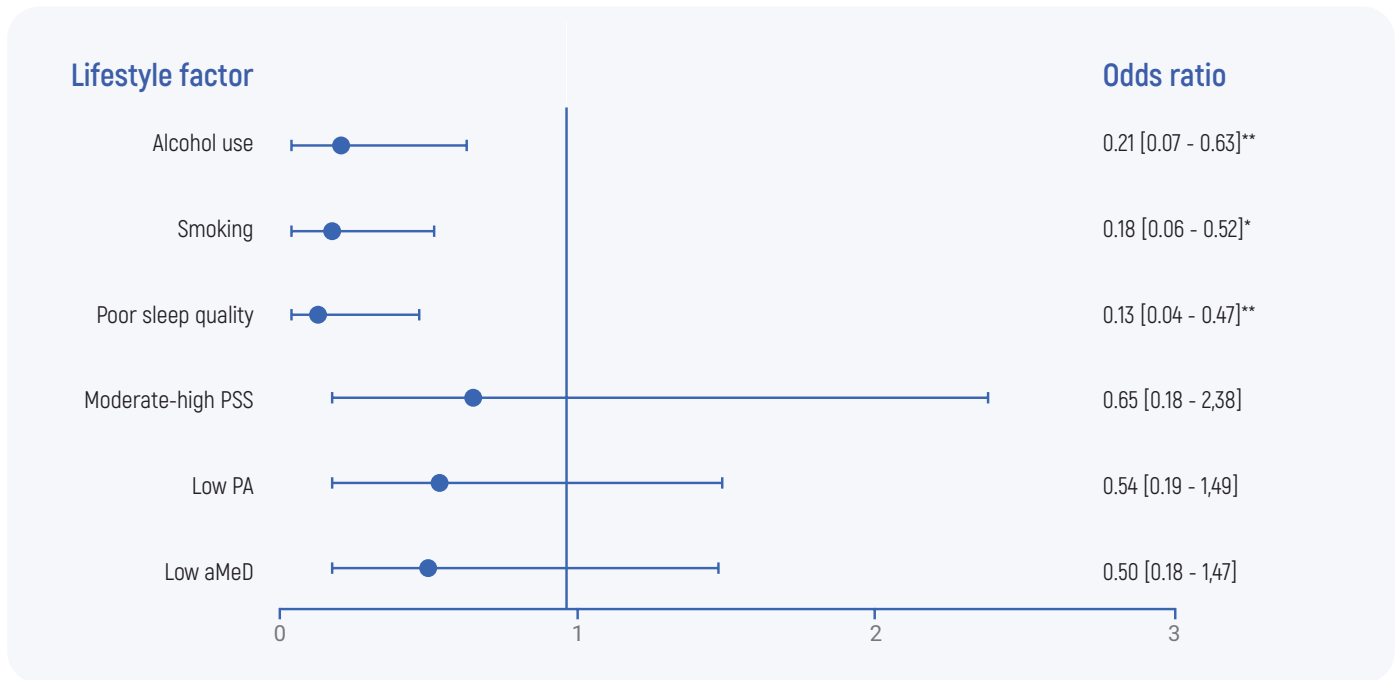
Aim

The aim of this prospective cohort study was to evaluate the association between lifestyle behaviours and clinical periodontal treatment outcomes (steps 1 and 2).

Materials & methods

- A prospective cohort study, carried out between February and August 2021, which included 120 participants aged from 18 to 70 years with localised or generalised untreated stage II/III periodontitis. The participants had at least one site with probing pocket depth (PPD) ≥4mm and more than 20 remaining teeth.

- Socio-demographic characteristics (age, gender, body mass index education), diabetes status, smoking/alcohol consumption, and lifestyle behaviours were assessed.

- Each participant answered four validated questionnaires: adherence to Mediterranean diet (QueMD), International Physical Activity Questionnaire (IPAQ), Perceived Stress Score (PSS), and the Pittsburgh Sleep Quality Index (PSQI).

- Patients were then categorised as having:
  - High or low adherence to the Mediterranean diet.
  - Moderate/high or low physical activity level.
  - Low or moderate/high PSS.
  - Good or poor sleep quality.

- Two calibrated examiners completed a full-mouth periodontal examination including:
  - Pocket probing depth (PPD), recession (REC), plaque and bleeding on probing (BoP) at six sites per tooth (excluding third molars).
  - Tooth mobility.
  - Clinical attachment level (CAL) at baseline and at three months after completion of steps 1 and 2 of periodontal therapy.

- Step 1 consisted of oral-hygiene instructions and motivation, professional, supragingival mechanical plaque removal with ultrasonic instruments, and smoking cessation.

- Step 2 consisted of quadrant-wise subgingival instrumentation with ultrasonic and hand instruments.

- One month after step 2, participants' oral-hygiene instructions and motivation were reinforced.

- The primary outcome of this study was the presence of a composite measure of "endpoint of therapy" defined at the patient level as no sites with residual PPD ≥4mm and BoP, and no sites with PPD ≥6mm.

- Patient-level outcomes included full-mouth plaque score, full-mouth bleeding score, percentage of sites with PPD ≥5mm and percentage with PPD ≥6mm, and one or more teeth with mobility.

- Site-level PPD, REC, CAL changes, and BoP at three months were also considered.

Figure: Forest plot for fully adjusted association between lifestyle behaviours and endpoint of periodontal therapy at three months (patient level)

Lifestyle factor	Odds ratio
Alcohol use	0.21 [0.07 - 0.63]**
Smoking	0.18 [0.06 - 0.52]*
Poor sleep quality	0.13 [0.04 - 0.47]**
Moderate-high PSS	0.65 [0.18 - 2,38]
Low PA	0.54 [0.19 - 1,49]
Low aMeD	0.50 [0.18 - 1,47]

Note: aMed: alternate Mediterranean diet score, PA: physical activity, PSS: perceived stress score.
The squares and bars represent the mean values and 95% confidence intervals. *p < 0.05; **p < 0.01.

Results

- After treatment, 76 of the 235 participants achieved the endpoint of the periodontal therapy at three months, leading to a reduction in the proportion of sites with PPD ≥5mm of around 60%.

- At patient and site level, multiple regression models were performed. The fully adjusted model included estimates adjusted for the value of the outcome at baseline, body-mass index, diabetes, household disposable income, three-month bleeding and plaque scores, and other lifestyle behaviours.

- At the patient level, participants with inadequate sleep, excessive smoking, and alcohol consumption that was higher than suggested exhibited significantly lower rates of successful treatment completion in the fully adjusted model. Smokers had a higher percentage of residual PPD ≥5mm.

- At the site level, low aMed (alternate Mediterranean diet) score and smoking demonstrated a detrimental relationship with changes in PPD, REC, and CAL. On the other hand, moderate/high PSS and excessive alcohol consumption exhibited an association solely with CAL and PPD changes.

- Participants who engaged in unhealthy lifestyles – characterised by low adherence to the Mediterranean diet, low physical activity, moderate/high perceived stress, and poor sleep quality – had a decreased likelihood of achieving the endpoint of therapy, even after accounting for smoking and alcohol use.

- Furthermore, these subjects exhibited a higher proportion of residual PPD ≥6mm and a diminished impact of periodontal therapy on PPD, REC, and CAL changes at the site level.

Limitations

- No threshold about suggested alcohol intake was mentioned.
- Subjective appreciation of stress and sleep-quality scores.
- Self-reported data for the diet and physical activity questionnaires, which could lead to social-desirability bias.
- Limited population sample.
- Impact of lifestyle behaviour modification was not evaluated.

Conclusions & impact

- This is the first study to evaluate the impact of a set of unhealthy lifestyle behaviours on the response to periodontal treatment.

- Poor sleep quality, smoking, and alcohol overuse were associated with significantly lower rates of reaching the endpoint of therapy.

- A correlation between a worse periodontal response and low adherence to the Mediterranean diet, low levels of physical activity, and high perceived stress was observed, but without statistical significance.

- Subjects showing a combination of unhealthy lifestyle behaviours showed reduced rates of successful periodontal therapy and a higher proportion of residual sites with PPD ≥6mm.

- Lifestyle behaviour counselling and modification should be conducted during step 1 of periodontal therapy, given its potential implication for periodontal treatment outcomes at three months. Lifestyle behaviours should also be considered in clinical periodontal research because they may act as confounding factors.

https://www.onlinelibrary.wiley.com/doi/10.1111/jcpe.13813

Access through EFP members' page log-in: http://efp.org/members/jcp.php