

From Checkups to Change: Longitudinal Changes in Lifestyle-Related Factors and Health Following Repeated Occupational Health Assessments

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Purpose: This study investigated how changes in body weight, perceived health, and exercise frequency varied in relation to time between health profile assessments (HPAs), the number of performed HPAs, and individual characteristics. We hypothesised that frequent HPAs, with shorter intervals, would be associated with more positive outcomes.

Methods: A cohort of 106,005 employees who completed at least two HPAs from 1990 to 2021 was analysed. Baseline age, sex, education, occupation, and baseline values of weight, perceived health, and exercise were included as predictors. Machine learning models (*XGBoost*) evaluated predictors of change for each outcome. Performance was assessed using root mean squared error, mean absolute error, and R-squared. Model interpretation was aided by SHapley Additive exPlanations and Forward Marginal Effects to examine dose–response relationships and subgroup differences.

Results: All models demonstrated relatively low predictive performance, suggesting that the included predictors did not capture substantial variance in outcomes. Nonetheless, a longer time between HPAs was associated with greater weight gain, while more frequent HPAs predicted slight reductions in weight gain, as well as modest improvements in perceived health and exercise frequency. According to model-derived SHAP values, the mean weight change from year 1 to 5 increased by 0.98, perceived health decreased by 0.21, and exercise frequency decreased by 0.31. Moreover, individuals who received 4–6 HPAs, compared to those who received only two, experienced a –0.10 difference in weight change, a 0.09 improvement in perceived health, and a 0.17 increase in exercise frequency. Subgroup analyses showed younger age groups had larger weight increases, while those with higher education displayed smaller declines in exercise.

Conclusion: Frequent and regular HPAs may play a role in enhancing workplace health promotion by contributing to modest improvements in weight, perceived health, and exercise.

