



Health-Coaching Microinterventions for Sedentary Office Workers

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Abstract

Prolonged occupational sitting has become a persistent behavioral health concern as contemporary office work increasingly depends on computers, virtual meetings, and digitally mediated tasks. Although conventional workplace wellness programs encourage physical activity, many require substantial time, organizational resources, or sustained employee motivation, limiting their integration into ordinary working routines. Health-coaching microinterventions offer an alternative approach by delivering brief, context-sensitive prompts, goal reminders, self-monitoring cues, and behavioral feedback at moments when prolonged sitting can realistically be interrupted. This simulation-based study examines the potential effectiveness of a structured eight-week health-coaching microintervention for reducing sedentary time among office workers. A hypothetical analytical sample of 180 sedentary employees was modeled, with equal allocation to a microintervention condition and a comparison condition. The intervention incorporated brief movement prompts, individualized daily goals, self-monitoring, feedback, and short coaching messages without requiring formal exercise sessions during working hours.

Simulated outcomes indicated a decline in mean sedentary time from 510 to 396 minutes per workday in the microintervention group, compared with a reduction from 508 to 483 minutes in the comparison group. Improvements were also modeled for movement-break frequency, behavioral self-efficacy, and perceived workday fatigue. The findings illustrate how low-burden behavioral coaching may operate through repeated interruption of sedentary routines, strengthened self-regulation, and gradual habit restructuring. Because all participant-level observations are simulated, the findings should be interpreted as methodological and hypothesis-generating rather than clinical evidence. The study provides a reproducible conceptual framework that may support subsequent workplace trials examining scalable health-coaching strategies for sedentary employees.

Keywords: sedentary behavior; office workers; health coaching; microinterventions; workplace health; behavioral self-regulation; movement breaks; occupational sitting

1. Introduction

Sedentary behavior has become an important occupational health issue within knowledge-intensive and digitally organized workplaces. Office employees may remain seated for extended periods while completing computer-based assignments, attending online meetings, responding to electronic communication, and performing administrative or analytical work. Sedentary behavior is distinct from insufficient moderate-to-vigorous physical activity because an individual may satisfy recommended



exercise targets while still accumulating prolonged periods of sitting during the working day. Dunstan and colleagues described excessive sitting as a health hazard in its own right, while subsequent epidemiological research has strengthened concern regarding prolonged sedentary exposure and adverse cardiometabolic outcomes. The World Health Organization's 2020 guidelines consequently emphasized limiting sedentary time and replacing sedentary behavior with physical activity of any intensity where feasible. Workplace health strategies therefore need to address not only exercise participation but also the structure and duration of sitting accumulated during normal occupational routines.

The organizational characteristics of office work make sedentary behavior particularly resistant to conventional health promotion. Sitting is frequently embedded within productivity expectations, workstation design, meeting cultures, communication practices, and professional norms. Employees may understand the general health benefits of movement yet postpone activity because immediate work demands carry greater psychological salience than long-term health considerations. O'Donoghue and colleagues showed that sedentary behavior is influenced by multiple individual, social, environmental, and occupational factors rather than by personal motivation alone. Consequently, educational messages that simply advise workers to "sit less" may have limited influence when the surrounding work environment repeatedly rewards uninterrupted desk engagement. Effective interventions should therefore reduce the cognitive and practical burden associated with translating health intentions into small, repeatable behavioral actions.

Health coaching provides one potential mechanism for bridging this intention–behavior gap. Traditional health coaching often uses goal setting, motivational communication, self-monitoring, feedback, and individualized problem solving to help participants convert broad health intentions into manageable behaviors. When adapted into microinterventions, these techniques can be delivered in brief episodes that occur within the normal workflow rather than through lengthy counseling sessions. A microintervention may consist of a 30-second behavioral reminder, a short personalized message, a prompt to stand during a telephone call, a two-minute movement break, or feedback indicating how current sitting patterns compare with an individual's daily target. The central principle is not to introduce an additional exercise program but to repeatedly create small decision opportunities in which sedentary behavior can be interrupted with minimal disruption.

Behavioral theory provides several reasons why repeated microinterventions may influence sedentary routines. Locke and Latham demonstrated the importance of specific goals for directing behavior, while Lally and colleagues showed that repeated actions performed within stable contexts can gradually acquire automatic characteristics. The Behavior Change Technique Taxonomy developed by Michie and colleagues further identifies goal setting, prompts and cues, action planning, self-monitoring, and feedback as distinct intervention components that can be systematically combined. Applied to sedentary office work, these principles suggest that brief coaching communications may be especially useful when they are contextually timed, behaviorally specific, and reinforced over multiple weeks. Small changes may accumulate into meaningful reductions in daily sitting even when each individual intervention episode requires only a few minutes.

The present study develops a simulation-based framework for assessing an eight-week health-coaching microintervention designed for sedentary office workers. Simulation is used because no real participant dataset has been supplied; therefore, the numerical outcomes in this manuscript are explicitly



hypothetical and should not be interpreted as evidence from an administered workplace trial. The model compares a microintervention condition with a low-intensity comparison condition and evaluates simulated changes in sedentary time, movement-break frequency, behavioral self-efficacy, and perceived workday fatigue. The study is intended to demonstrate how a future empirical investigation could operationalize, analyze, and interpret a low-burden workplace intervention while maintaining a clear distinction between conceptual evidence and experimentally observed outcomes.

2. Objectives of the Study

2.1 Primary Behavioral Objective

The primary objective of the study is to examine whether an eight-week health-coaching microintervention could plausibly reduce mean sedentary time during the workday when compared with a minimal-information condition. Sedentary minutes per workday are treated as the principal behavioral outcome because the fundamental purpose of the intervention is to interrupt extended periods of occupational sitting without requiring employees to withdraw from ordinary work responsibilities. The simulation specifically considers whether repeated low-duration prompts, goal reminders, and individualized behavioral feedback could produce a cumulative change that is larger than the modest reduction expected from general health information alone.

A related objective is to examine the temporal pattern through which behavioral change might develop. Rather than assuming that sedentary behavior changes immediately after intervention exposure, the analytical framework models progressive reductions across eight weeks. This approach reflects the possibility that employees may initially respond inconsistently to movement prompts but become more responsive as standing, brief walking, and task-linked movement are progressively integrated into the working day. Evaluating the weekly trajectory therefore provides information about the potential accumulation of micro-level behavioral adjustments.

2.2 Self-Regulation and Behavioral Capability Objective

The second objective is to assess whether health-coaching microinterventions could improve employees' perceived ability to regulate sitting behavior. Sedentary work is often maintained by automatic routines, competing demands, and limited awareness of uninterrupted sitting periods. Coaching strategies that support self-monitoring, action planning, and goal review may strengthen behavioral self-efficacy by helping workers identify realistic opportunities for movement within existing occupational constraints. The simulation therefore incorporates a self-efficacy measure as an intermediate behavioral outcome.

The study also examines movement-break frequency because total sedentary duration alone does not fully represent the temporal organization of sitting. Healy and colleagues demonstrated the relevance of breaks in sedentary time to metabolic risk indicators, supporting attention to the pattern as well as the overall volume of sedentary exposure. A successful microintervention would consequently be expected to increase the number of purposeful interruptions accumulated during the working day while simultaneously reducing total sitting duration.



2.3 Workplace Well-Being and Implementation Objective

A third objective is to explore whether reductions in uninterrupted sitting can coexist with favorable perceptions of workday well-being. Interventions that substantially interrupt concentration or impose unrealistic behavioral expectations are unlikely to be sustained even when they produce short-term activity increases. The present framework therefore considers perceived workday fatigue as a secondary outcome and assumes that movement prompts should remain short enough to be integrated into normal work activity.

The implementation objective is equally important. The proposed approach is intentionally designed around low-resource behavioral components that can potentially be delivered through workplace communication systems, mobile applications, calendar notifications, or digital coaching platforms. The study therefore evaluates the conceptual feasibility of an intervention that emphasizes frequency, personalization, and behavioral specificity rather than lengthy face-to-face coaching sessions. Such an approach may be particularly relevant for organizations seeking scalable methods of supporting employee health without substantially restructuring working schedules.

3. Review of Literature

3.1 Occupational Sedentary Behavior and Health Risk

The health implications of prolonged sedentary behavior have been examined across observational, experimental, and systematic-review evidence. Dunstan and colleagues characterized excessive sitting as a distinct health concern and emphasized that technological and environmental changes have progressively reduced opportunities for routine movement. Thorp and colleagues similarly reported associations between sedentary behaviors and several adverse health outcomes in adults. Although causal interpretation varies across outcomes and study designs, the accumulated literature supports the view that prolonged sedentary exposure constitutes an important behavioral target for public and occupational health.

Ekelund and colleagues provided influential evidence concerning the interaction between sitting and physical activity by analyzing data from more than one million adults. Their findings indicated that higher levels of moderate-intensity physical activity may attenuate some of the mortality risks associated with prolonged sitting, while lower activity levels combined with substantial sitting remain particularly concerning. Such findings are relevant to office environments because they suggest that occupational sitting should not be considered independently of broader movement behavior. Nevertheless, replacing portions of seated work with standing or light-intensity activity may represent a more immediately achievable intervention target than expecting all employees to adopt extensive exercise programs outside working hours.

3.2 Workplace Strategies for Reducing Sitting

Workplace intervention research has examined sit–stand workstations, environmental restructuring, organizational policies, behavioral counseling, computer prompts, and combinations of these approaches. Neuhaus and colleagues reported that activity-permissive workstations can reduce occupational sitting, while Chu and colleagues found that multicomponent workplace interventions generally produce stronger reductions than strategies relying on a single informational component.



Shrestha and colleagues, in a Cochrane review, also concluded that sit–stand desks and some behavioral strategies can reduce workplace sitting, although the quality and duration of evidence varied substantially across studies.

These findings suggest that behavioral interventions are most useful when they modify immediate opportunities for action rather than merely increasing awareness. Computer prompts can remind employees that they have been seated for an extended period, but prompts may lose effectiveness when they become repetitive, poorly timed, or disconnected from individual goals. Health coaching may address this limitation by linking prompts with personalized targets, feedback, and self-regulatory strategies. The theoretical advantage of coaching is therefore not simply that it sends more messages, but that it can convert a generic reminder into an individualized behavioral decision supported by previously established goals.

3.3 Microinterventions, Habit Formation, and Self-Regulation

Microinterventions are consistent with behavioral models emphasizing small, repeated actions embedded within stable contexts. Lally and colleagues demonstrated that behavioral automaticity develops gradually and that repetition within a consistent context is central to habit formation. In sedentary workplaces, standing when answering a particular type of call, walking briefly after completing a scheduled task, or changing posture following an electronic prompt could serve as context-linked behaviors that become easier to perform through repetition. The modest duration of each action may reduce resistance because employees are not required to perceive themselves as beginning a formal exercise session.

Michie and colleagues' taxonomy of behavior-change techniques provides additional structure for designing such interventions. Goal setting can specify the desired amount of sitting reduction; action planning identifies when and where movement will occur; prompts and cues initiate action; self-monitoring provides awareness; and feedback supports adaptation. Gardner and colleagues' review of strategies for reducing sitting similarly emphasized the usefulness of self-regulatory and environmental techniques. However, an important gap remains between knowing which behavior-change techniques are theoretically relevant and determining how they can be delivered in sufficiently brief forms to remain acceptable during cognitively demanding office work. This gap motivates the present microintervention framework.

4. Research Methodology

4.1 Study Design and Simulated Sample

The study uses a two-group, eight-week simulation-based design representing a future randomized workplace intervention. A hypothetical sample of 180 office employees is modeled, with 90 assigned to the health-coaching microintervention condition and 90 assigned to a comparison condition. Eligibility in the simulated design requires employees to be between 23 and 60 years of age, undertake predominantly desk-based work, spend at least six hours of a typical workday at a workstation, and have no restriction that would prevent routine standing or short-duration walking. These characteristics are hypothetical parameters rather than observations collected from actual individuals.



Simulation was selected to demonstrate the analytical structure of a possible intervention without presenting invented observations as empirical evidence. Baseline characteristics are assumed to be approximately balanced between conditions to represent successful random allocation. Sedentary time is expressed as minutes per standard workday, movement breaks are defined as purposeful interruptions of sitting lasting at least one minute, behavioral self-efficacy is modeled on a five-point scale, and perceived workday fatigue is modeled on a ten-point scale. All values presented later in the manuscript are generated for methodological illustration.

Table 1: Simulated Study Design and Measurement Framework

Component	Microintervention Group	Comparison Group	Measurement Point
Simulated participants	90	90	Baseline
Intervention duration	8 weeks	8 weeks	Entire study
Daily behavioral prompts	3 brief prompts	None	Workdays
Personalized sitting-reduction goal	Yes	No	Weekly review
Self-monitoring feedback	Yes	No	Daily/weekly
General sedentary-health information	Yes	Yes	Baseline
Sedentary minutes/workday	Recorded	Recorded	Baseline and weekly
Movement breaks/workday	Recorded	Recorded	Baseline and week 8
Behavioral self-efficacy	5-point scale	5-point scale	Baseline and week 8
Workday fatigue	10-point scale	10-point scale	Baseline and week 8

Note: All participant numbers, intervention exposures, and outcomes are simulated for methodological demonstration and do not represent data collected from human participants.



4.2 Health-Coaching Microintervention Protocol

The modeled intervention combines several established behavior-change techniques in brief delivery units. Participants in the intervention condition receive three context-sensitive prompts during each standard workday. Rather than instructing employees to undertake extended exercise, prompts recommend immediately achievable behaviors such as standing for two minutes, walking during a non-visual telephone call, completing a short office corridor walk, refilling drinking water, or conducting part of a routine conversation while standing. Each behavioral request is intentionally small so that completion does not require substantial preparation, clothing changes, equipment, or interruption of professional responsibilities.

At the beginning of each week, the simulated coaching system provides a personalized sitting-reduction goal derived from the participant's previous pattern. Daily feedback summarizes progress and identifies periods during which sitting remained uninterrupted for particularly long durations. Coaching language is framed to support autonomy rather than impose punitive targets. If a participant repeatedly fails to respond during specific periods, subsequent prompts are shifted toward more feasible moments. The intervention therefore represents adaptive behavioral coaching rather than a rigid reminder system.

4.3 Analytical Strategy

The primary outcome is change in mean sedentary minutes per workday from baseline to week eight. Secondary outcomes include movement breaks per workday, behavioral self-efficacy, and perceived workday fatigue. Descriptive statistics are used to compare simulated group means at baseline and follow-up. The principal intervention effect is expressed as the difference in change between groups, calculated by subtracting the comparison group's baseline-to-follow-up change from the corresponding intervention-group change.

The simulated analysis assumes two-tailed significance testing at an alpha level of .05 and reports illustrative p-values and standardized effects solely to demonstrate how future empirical results could be communicated. Weekly sedentary-time trajectories are additionally examined to determine whether the intervention effect develops progressively. No actual hypothesis test has been performed on observed human-subject data, and the statistical values should therefore be interpreted as modeled outputs rather than confirmatory evidence.

5. Analysis

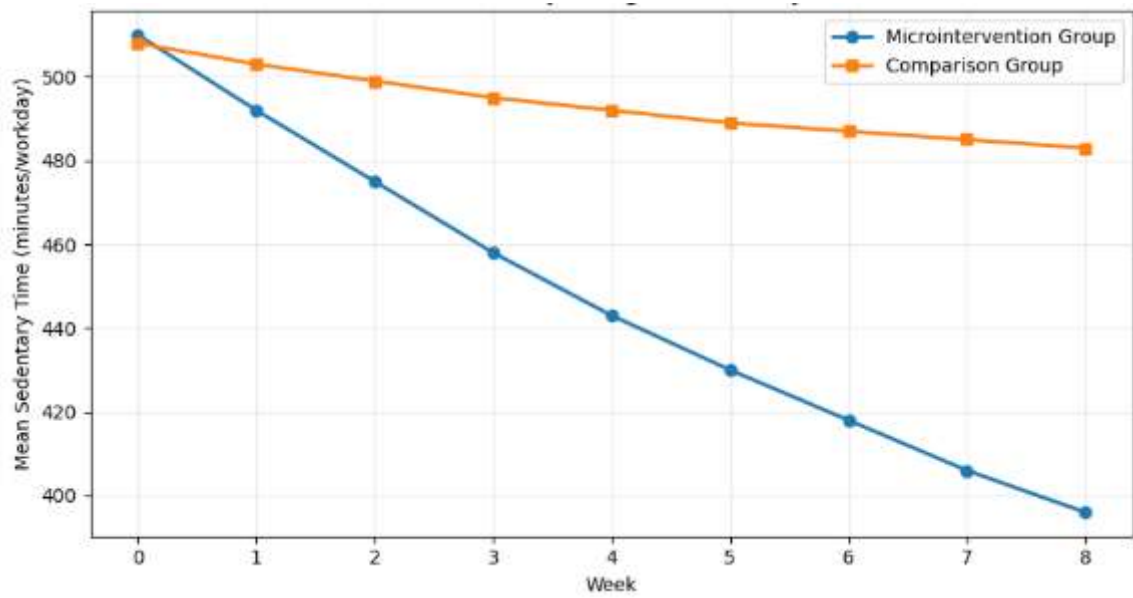
5.1 Change in Sedentary Time

At baseline, the simulated mean sedentary duration was 510 minutes per workday in the microintervention group and 508 minutes in the comparison group, indicating negligible initial separation. Over the eight-week period, the microintervention trajectory declined progressively, reaching 396 minutes per workday at week eight. This represents a modeled within-group reduction of 114 minutes. The comparison group demonstrated a substantially smaller change, decreasing from 508 to 483 minutes, equivalent to a 25-minute reduction.

The resulting difference-in-change is therefore 89 minutes per workday in favor of the health-coaching microintervention. In practical terms, the simulated intervention replaces approximately one and one-half hours of workday sitting with standing, light movement, or other non-sedentary behavior

relative to the change modeled for the comparison group. The progressive weekly pattern is important because it suggests that the hypothetical effect is not generated by an abrupt unrealistic behavioral shift but by the accumulation of repeated behavioral adjustments.

Graph 1: Simulated Weekly Change in Mean Sedentary Time



Graph Note: Week 0 represents baseline. Values are simulated and are provided exclusively for methodological illustration.

Interpretation: The microintervention trajectory shows a sustained week-by-week decline, whereas the comparison condition changes only modestly. The widening difference between trajectories illustrates the hypothesized cumulative influence of repeated coaching prompts and self-regulatory feedback.

Key Finding: By week eight, the modeled between-group difference in sedentary time is 87 minutes per workday at the observed endpoint and approximately 89 minutes when expressed as the difference between baseline-to-follow-up changes.

5.2 Movement Breaks and Behavioral Self-Efficacy

The simulated secondary outcomes support the proposed behavioral mechanism. Mean movement-break frequency increases from 5.2 to 8.9 breaks per workday in the intervention condition, compared with an increase from 5.1 to 5.8 breaks in the comparison condition. The modeled between-group difference at follow-up therefore favors the intervention by 3.1 movement breaks per workday. This change is consistent with an intervention explicitly designed to interrupt extended sitting episodes rather than simply encourage exercise outside working hours.

Behavioral self-efficacy demonstrates a parallel pattern. The intervention group's simulated score increases from 3.1 to 4.1 on a five-point scale, whereas the comparison group changes from 3.2 to 3.4. Such a pattern would be theoretically consistent with repeated successful completion of manageable movement goals. When employees repeatedly observe that short movement breaks can be performed



without compromising routine work, the perceived difficulty of regulating sedentary behavior may gradually decline.

Table 2: Simulated Baseline and Week-Eight Outcomes

Outcome	Microinterventi on Baseline	Microinterventi on Week 8	Comparis on Baseline	Comparis on Week 8	Simulate d Between -Group Effect	Illustrati ve p- value
Sedentary time, min/workday	510	396	508	483	–89 min differenc e-in- change	<.001
Movement breaks/workd ay	5.2	8.9	5.1	5.8	+3.0 differenc e-in- change	<.001
Self-efficacy, 1–5	3.1	4.1	3.2	3.4	+0.8 differenc e-in- change	.002
Workday fatigue, 1–10	6.4	5.1	6.3	6.0	–1.0 differenc e-in- change	.008

Source/Note: Entire table contains simulated values generated for methodological illustration. The p-values are illustrative analytical outputs and must not be interpreted as results from an actual participant trial.

5.3 Perceived Fatigue and Overall Response Pattern

Perceived workday fatigue also improves under the simulated intervention. Mean fatigue decreases from 6.4 to 5.1 points in the microintervention condition while declining from 6.3 to 6.0 in the comparison condition. The modeled difference-in-change is approximately one point. This pattern suggests that interrupting long sedentary episodes need not necessarily increase perceived disruption or tiredness and may, under favorable circumstances, coincide with improved subjective workday functioning.

Taken together, the modeled outcomes indicate convergence across behavioral and perceptual measures. Reduced sedentary duration occurs alongside more frequent movement breaks, greater



behavioral self-efficacy, and lower fatigue rather than appearing as an isolated statistical change. Such convergence would strengthen interpretation in a future empirical study because the primary outcome would be supported by variables representing plausible behavioral mechanisms. Nevertheless, the present values remain hypothetical, and real-world effect sizes could be smaller, larger, or absent depending on workforce characteristics, organizational culture, intervention adherence, and measurement quality.

6. Discussion

6.1 Behavioral Significance of Brief Coaching

The simulated findings illustrate how brief health-coaching interventions might influence sedentary office behavior without requiring a conventional exercise program. The modeled reduction of 114 sedentary minutes within the intervention group emerges from repeated small changes rather than from one substantial daily activity session. This distinction is important because office workers frequently identify lack of time as an obstacle to workplace health participation. Microinterventions attempt to reduce this obstacle by positioning movement within activities employees already perform rather than adding a separate behavioral obligation.

The intervention is also theoretically compatible with evidence synthesized by Gardner and colleagues concerning behavior-change strategies for reducing sitting. Prompts, self-monitoring, goal setting, and restructuring of routine can work together to make sedentary behavior more visible and interruptible. A prompt alone may eventually be ignored, but a prompt linked to a meaningful goal and followed by feedback has greater informational value. The health-coaching framework consequently treats each prompt as one element within a broader self-regulatory sequence rather than as an independent digital notification.

6.2 Habit Restructuring and Self-Efficacy

The progressive simulated trajectory may be interpreted through the concept of behavioral automaticity. Office sitting is often initiated without deliberate decision-making because workstations, screens, and professional routines repeatedly cue the same seated response. Lally and colleagues' work on habit formation suggests that repeated behavior in stable contexts can gradually become easier and more automatic. The same principle that helps explain persistent sitting can potentially be used to establish competing movement routines. Standing during a scheduled call or walking immediately after completing a recurring task may become a context-linked response when repeated consistently.

The modeled increase in self-efficacy is particularly relevant to this process. Employees who initially perceive movement breaks as incompatible with productivity may revise that belief when they repeatedly complete short activity episodes without negative occupational consequences. In this sense, microcoaching may operate not only through external reminders but also through gradual changes in behavioral confidence. Once workers become capable of identifying their own opportunities for movement, dependence on externally delivered coaching may decline, which would be an important indicator of successful behavioral internalization in a longitudinal trial.

6.3 Workplace Application, Limitations, and Research Implications

From an organizational perspective, the principal attraction of microinterventions is their potential scalability. Individual face-to-face health coaching can be valuable but may require personnel, scheduling, and financial resources that are unavailable in many workplaces. Brief digital coaching can potentially be embedded within existing communication platforms, mobile devices, calendars, or occupational wellness systems. However, implementation should be carefully governed. Excessive prompting may produce notification fatigue, poorly timed prompts may interrupt complex tasks, and standardized recommendations may be inappropriate for workers with different physical capabilities or job responsibilities.

The limitations of the present study are therefore substantial and should be explicitly recognized. No human participants were recruited, no physical-activity monitor was deployed, no coaching system was implemented, and no real organizational outcomes were observed. The effect sizes and significance values are simulated and cannot establish effectiveness, safety, acceptability, or causality. A future empirical study should use objective sedentary-behavior measurement where feasible, report intervention adherence, evaluate productivity perceptions, include sufficiently long follow-up, and investigate whether benefits persist after coaching prompts are reduced or discontinued. Research should additionally examine whether intervention effects differ according to age, job autonomy, remote-working status, baseline activity, organizational culture, or workspace design.

7. Conclusion

Sedentary office work represents a behavioral health challenge that cannot be fully addressed by advising employees to exercise more during their leisure time. Extended sitting is embedded within occupational routines, digital workflows, environmental conditions, and automatic behavioral patterns. Health-coaching microinterventions offer a conceptually attractive approach because they target these routines through brief, context-sensitive opportunities for movement while minimizing interference with ordinary job responsibilities.

The present simulation suggests how an eight-week intervention incorporating prompts, individualized goals, self-monitoring, and behavioral feedback could be evaluated. Within the hypothetical analytical model, sedentary time declined substantially more in the microintervention condition than in the comparison condition, while movement-break frequency and behavioral self-efficacy increased and perceived fatigue decreased. The progressive weekly trajectory further illustrates the possibility that repeated small behavioral actions may accumulate into a meaningful change in the overall structure of the workday.

These findings should not be interpreted as evidence that the proposed intervention has already been clinically or occupationally validated. Every participant-level value and statistical result reported in the manuscript is simulated. The primary contribution of the study is therefore methodological and conceptual: it demonstrates a theoretically grounded intervention architecture, specifies measurable outcomes, and provides a transparent analytical framework that can be tested through future randomized or quasi-experimental workplace research.

Future empirical validation should determine whether the modeled benefits can be replicated under real working conditions and maintained beyond the active coaching period. Particular attention

should be given to objective measurement, intervention adherence, employee autonomy, organizational acceptability, and the possibility of prompt fatigue. If supported by rigorous real-world evidence, carefully designed health-coaching microinterventions could become a scalable component of workplace health promotion by transforming sedentary behavior through small, repeated, and contextually feasible changes rather than through disruptive modifications to the working day.

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