Behavioural Interventions to Improve Home-Based Office-Workers' Health

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Abstract

Many organizations have traditionally supported their employees' physical and mental health through a variety of office-based programs and interventions. The shift from in-office work to working from home, which has been accelerated by the COVID-19 pandemic, requires organizations to update their toolbox to continue supporting a healthy and happy workforce. In this paper, we review research on successful, evidence-based interventions in four key areas of physical and mental health: physical activity and sedentary behaviour, nutrition, loneliness, and stress. We show how organizations could adapt these interventions to a home-based office environment and conclude by highlighting areas of future research, as well as by discussing the role of health professionals and policymakers in designing effective interventions for the future of work.

Keywords:

Behavioural interventions, employee well-being, remote work, physical health, mental health

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The World Health Organization defines health as a “state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 2021). Leading a healthy lifestyle is not only closely connected with happiness (Mujcic and Oswald, 2016, Netz et al., 2005), but can decrease the rate of aging (Goetzel et al., 2011) and extend life expectancy by up to 14 years (Liu et al., 2018).

Across Europe and the United States, the average full-time worker spends roughly half of her waking hours at work (Giattino et al., 2013), placing employers in a unique position to influence employees' health and well-being. Aside from health being intrinsically valuable and recognized as a universal human right, employers benefit directly from investing in the health of their workforce. Healthier employees are more productive, more satisfied with their job and more likely to innovate at work (Huhtala and Parzefall, 2007; Wright and Huang, 2012). Not surprisingly, many organizations have implemented research-backed interventions to improve the physical and mental health of their workforce (see e.g., Chance et al., 2016; Slaunwhite et al., 2009; Venema et al., 2018).

After SARS-CoV-2 (COVID-19) was declared a global pandemic (WHO, 2020b), work routines were fundamentally altered. While lockdowns, social distancing measures, and travel restrictions brought new challenges for our personal lives, full-time work-from-home — also referred to as “home-office” or “teleworking” — experienced a surge among non-essential office-based workers across the globe.¹ Working from home is predicted to outlive the COVID-19 pandemic in some form and will likely remain a permanent feature for many traditionally office-based occupations (Hickman and Robison, 2020). The transition to a home-office environment has rendered many established workplace interventions impractical or no longer feasible, demanding a critical rethinking of how organizations can support their employees' health and well-being.

Based on the existing literature of successful interventions related to physical and mental health, this paper intends to equip organizations with effective and easily adaptable tools to continue improving the health of their employees within the work-from-home setting. The paper also highlights areas where new evidence is needed, serving as a possible reference for researchers and policy makers. We organize our contributions around two major areas: physical health and mental health.

¹ While merely 15% of those employed in the European Union (EU) had ever worked from home prior to the outbreak of the COVID-19 pandemic (European Commission, 2020), this number jumped to almost 40% as of July 2020 (Eurofound, 2020), albeit with considerable variation across occupations and geographical areas.

Critical Areas and Interventions

Physical Health

Physical inactivity and unhealthy eating represent two of the leading risk factors for non-communicable diseases, such as cardiovascular disease, diabetes and obesity (Cecchini et al., 2010, Lee et al., 2012). Poor employee physical health resulting from these risk factors also pose substantial concerns for employers due to increased absenteeism and loss of productivity (Proper and van Mechelen, 2008).

Physical Activity and Sedentary Behaviour

As work becomes increasingly sedentary in nature, a growing number of desk-based workers are at an elevated risk of obesity, chronic illness, and premature mortality (Church et al., 2011, Chau et al., 2013). To cope with the health risks of physical inactivity, it is necessary to increase energy expenditure while decreasing sedentary behaviour (Hamilton et al., 2008).² However, the COVID-19 pandemic has worsened the problem, as evidenced by a reduction of physical activity (Ammar et al., 2020a, Meyer et al., 2020), decreased step counts (Tison et al., 2020), and increased time spent sedentary (Ammar et al., 2020a). While some of these effects are likely to be temporary (e.g., the COVID-19-related closures of gym facilities), others are bound to remain as a permanent feature of working from home (e.g., lack of physical activity connected to a decrease in active commuting). Updated recommendations and interventions are needed to promote physical activity and reduce sedentary behaviour of employees working from home, during and after work hours.

Active workstations. One of the most widely studied methods to reduce sedentary behaviour during the workday is the provision of alternative workstations that allow employees to stand or be active while working. Although traditional workstations have been designed for sitting, the use of sit-stand workstations can reduce time spent sitting by around 100 minutes per day (Shrestha et al., 2018). Although less studied, evidence suggests that active workstations, which allow the user to engage in physical activity such as walking or cycling while working (Elmer and Martin, 2014), may be effective at reducing sedentary behaviour.³ While work-from-home means that employers lose full control over the workstation chosen by their employees, employers may consider providing

² Specifically, adults should engage in at least 75 minutes of vigorous or 150 minutes of moderate physical activity per week (WHO, 2020a) and should regularly break up their sitting behavior (i.e., at least 2 hours of accumulated standing or light physical activity per day (Buckley et al., 2015)).

³ Office-workers provided with access to a treadmill workstation experienced reductions in time sitting, increased physical activity, and improved health outcomes (Schuna Jr et al., 2014, John et al., 2011).

equipment or advice to improve their employees' choice for a home workstation. For example, standing desk converters (or desk risers) are both cost-effective and easily adaptable to the variety of domestic architectures that host home offices.

Active meetings. In addition to altering workstations, organizations may consider shifting norms around sedentary behaviour during the workday. For example, team managers and leaders could actively promote a culture of standing during meetings (Neuhaus et al., 2014, Danquah and Tolstrup, 2020). Encouraging active meetings, such as by designating specific meetings as “desk-free”, indicating that employees are recommended to join the meeting via their mobile devices while taking a walk, or by integrating periods of active movement and/or stretching into traditional meetings, may allow employees more opportunities to be physically active during the workday while creating a team norm of activity during the workday (Kling et al., 2016). Although walking meetings may face a number of logistical barriers (Danquah and Tolstrup, 2020), recommending employees to go on walks during periods of ideation may be especially beneficial for physical health and creativity, as research indicates that walking can improve creative thinking (Oppezzo and Schwartz, 2014). Additional support from team leaders, such as a weekly recommendation, can help cultivate an environment that supports employees in being active whenever possible (Healy et al., 2013, Quintiliani et al., 2007).

Temptation bundling. A promising way to boost physical activity after working hours is to help employees combine exercising with a typically more pleasant activity, such as watching TV. In the literature, this approach is referred to as temptation bundling.⁴ Given that leading streaming websites offer subscriptions for less than \$10 a month, providing employees with such a subscription and encouraging them to combine watching and exercising could be a simple and inexpensive way to increase physical activity at home. Alternatively, budget-tight employers can leverage the surge in the utilization of streaming services (Statista, 2020) and simply recommend employees who have already independently chosen these subscriptions to be physically active during streaming time.

Monetary incentives. A second or complementary approach to promote physical activity of employees after work hours is to pay people for reaching pre-specified daily (or weekly) physical activity targets. While the literature

⁴ Milkman et al. (2014) and Kirgios et al. (2020) conducted field experiments on the effects of temptation bundling on exercise. They show that providing people with audiobooks and encouraging them to listen to these whenever they work out significantly increases gym attendance during and after the intervention period. Kirgios et al. (2020) provide additional suggestive evidence that the audiobooks acted both as an extra motivator and as a reminder to exercise. Milkman et al. (2014) note that streaming TV shows rather than listening to audiobooks could be an even stronger stimulus to exercise.

has identified some guiding principles on how to best offer monetary incentives,⁵ one key feature requires that the incentivized behaviour be verified. The rise of smartphone technology and wearable trackers has made it easy to count one's daily steps and to share this data with others. While monetary incentives have proven effective in helping people change their behaviour in various health-related areas,⁶ we think that walking targets may be a particularly fruitful domain. Walking is a generally accessible activity requiring no extra equipment or special location, and as such is particularly cost-effective. Moreover, we speculate that walking targets may be particularly easy to implement within a work-from-home setting, where walking can be more organically incorporated into errands and household chores, compared to a traditional office setting.

Nutrition

Healthy eating is essential to maintaining good health.⁷ On any given day, we make approximately 200 food-related decisions (Wansink and Sobal, 2007). However, we are often not aware that we are making these decisions which means these choices can be heavily influenced by the choice architecture of our physical environments. Historically, organizations have taken advantage of this fact by making explicit changes to both workplace break rooms (Chance et al., 2016), and cafeteria layout and labelling (Chance et al., 2016; Thorndike et al., 2012; Velema et al., 2018) to effectively steer employees toward healthier food choices. While organizations no longer have the ability to harness the power of choice architecture to influence nutritional habits of their employees working at home, we argue that they are still in a position to play a key role in encouraging healthy nutrition through other means.

Visual reminders. Visual reminders are a common and powerful method to sub- consciously influence individuals' drink and food choices. For example, close proximity of water to an office-workers' desk was found to increase the amount that the employee drank throughout their workday (Wildermuth, 2018). While visual cues were

⁵ Mitchell et al. (2020) review the literature on the effects of financial incentives on physical activity. Based on their analysis, they recommend that financial incentives should be targeted at inactive people, can be modest in size but should be offered for longer periods. For walking, Bachireddy et al. (2019) find that constant incentives work better than incentives that are decreasing or increasing in size over time. To keep costs low, an employer should consider offering threshold incentives, i.e. people are only paid if they manage to surpass a certain minimum level of activity (Aggarwal et al., 2020).

⁶ such as walking, exercising in the gym, losing weight, quitting smoking, and reducing alcohol consumption (see e.g. Charness and Gneezy, 2009; Burger and Lynham, 2010; Giné et al., 2010; Augurzy et al., 2018; Halpern et al., 2015; Royer et al., 2015; Bachireddy et al., 2019; Schilbach, 2019 and Aggarwal et al., 2020).

⁷ For example, a daily intake of at least five portions of fruit and vegetables, less than 50 grams of sugars, and the reduction of fat and salt is recommended (WHO, 2020a). Part of a healthy diet also includes a total daily water intake of at least 4-6 cups (1-1.5 liters) to help manage body weight and prevent dehydration (Harvard Health Publishing, 2016).

traditionally disseminated within the physical spaces of the office environment, the principle can also be adapted to the home-office. For example, providing a (recyclable) water bottle to employees working from home, and asking them to “bring it” to conference calls, could result in a similar effect.

Food vouchers. Another promising intervention is to reallocate resources previously designated for company cafeterias to food vouchers for home-delivery of healthy foods, such as fruits and vegetables. Such food vouchers decrease the relative price of healthy foods compared to unhealthy foods. Not surprisingly, the relative price change has shown to increase the consumption of healthy food (Sadoff and Samek, 2019; Brownback et al., 2020). Further, evidence suggests that such a push towards eating healthier can lead to a persistent change in food preferences (Sadoff and Samek, 2019). The positive effects of healthy food vouchers can be amplified not only by letting people decide on their food orders in advance (Brownback et al., 2020; Sadoff et al., 2020), but by providing information about the benefits of eating healthily before people make their orders (Sadoff and Samek, 2019). Lastly, food vouchers for healthy foods and ingredients can also stimulate employees to prepare more home-cooked meals, which has been shown to be associated with the consumption of a healthier diet (Mills et al., 2017).

Mental Health

The need to address mental health at the workplace has been identified by several authors (Goetzel et al., 2018; Memish et al., 2017; LaMontagne et al., 2014; Page and Vella-Brodrick, 2009). Poor employee mental health not only represents a huge burden for the individual, but has negative economic consequences for companies due to absenteeism and loss of productivity (Evans-Lacko and Knapp, 2016; Birnbaum et al., 2010).

Moreover, COVID-19 has brought about a huge additional mental burden with increasing levels of anxiety, depression (Salari et al., 2020), loneliness and insomnia (Ammar et al., 2020b). While some of the negative effects on mental well-being are likely to be temporary (e.g., COVID-19-related anxiety about job-security or health), others may remain post-COVID-19, in particular the increased risk of loneliness (Buffer, 2020) and stress associated with working from home. It is therefore important to equip organizations with mental health interventions that are effective within a work-from-home environment.

Loneliness

Social interactions are important contributors not only to good physical health, mental health, and longevity (Umberson and Karas Montez, 2010), but also to overall employee happiness (Rosales, 2015). When working fully remotely, employees lack in-person social interactions with their colleagues, and in particular miss out on meaningful connections (Gallup, 2017). Fewer in-person interaction can increase feelings of loneliness or isolation, which is a major driver of anxiety and depression (Slack, 2020; Mental Health America, 2020). While substantive and meaningful conversations are the gold standard in terms of happiness and well-being, it is still significantly better to engage in small talk than in no talk at all (Milek et al., 2018). When shifting to a (partial) work-from-home environment, employees lose out on the many spontaneous opportunities for small talk. Therefore, it is crucial that managers are intentional about creating opportunities for co-workers to connect.

Embedding opportunities for connection into work-meetings. In practice, team leads or managers could reserve the first few minutes of a weekly meeting for relationship building (Grenny and Maxfield, 2017). During that time, employees could share good personal and professional news (Gable et al., 2004) or express their gratitude to their colleagues (Algoe, 2012) as interactions that involve sharing positive emotions have shown to build particularly strong relationships (Algoe, 2019). Alternatively, those first minutes can be dedicated toward the practice of self-disclosure, such as the Generating Closeness Task, a series of short questions with increasing levels of self-disclosure, that has been proven to increase closeness between people (Aron et al., 1997).

Digital communication platforms. For organizations in industries with limited meeting opportunities, or for those seeking to provide additional opportunities to connect, popular communication platforms, such as Slack or Microsoft Teams, could serve as a platform to boost (positive) connection. On Slack, for example, employees could be encouraged to post a message in a ‘Gratitude Channel’ at the end of every workweek, publicly thanking a colleague for their help or hard work throughout the week. Other sources have suggested using these communication platforms to share recipes, articles, or snapshots (Groysberg and Abrahams, 2020).

Stress

Work-related stress is a prevalent yet detrimental experience for desk-based workers (Shirom, 2003). Although working from home may relieve employees from a variety of traditional stressors associated with in-office work, e.g., long commuting times (Chatterjee et al., 2017; Zhang and Feinzig, 2017), working from home can also create new stressors for employees. For example, by increasing workers’ reliance on digital communication,

employees working from home may be expected to more carefully monitor e-mail and other sources of internet-based communication. An overabundance of digital communication, which includes the increased use of teleconferencing, can contribute to a perception of work overload (Gupta et al., 2013) and harm employee well-being (Keller et al., 2020; Akbar et al., 2019). Working from home may also lead to distractions unique to the physical home environment, such as interruptions from a family member or the need to tend to other home-based demands (Delanoeije et al., 2019). Indeed, research suggests that the lack of physical and psychological boundaries separating work from home can make it difficult to disconnect from work and result in longer work hours (Diaz et al., 2012). The tendency to engage in work behaviour beyond typical work hours has been associated with increased stress (Mazmanian et al., 2013), burnout (Wright et al., 2014), emotional exhaustion (Xie et al., 2018), and work-life conflict (Diaz et al., 2012, Derks et al., 2015). The following section describes a selection of strategies that organizations and team managers can use to prevent or reduce the negative impact of stress on employees.

Mindfulness and positive psychology interventions. Mindfulness-based and positive psychology interventions represent one promising approach to help employees reduce stress while working from home. In one study, employees experienced reductions in work-life conflict, a major source of stress, after being provided with a six-week mindfulness-based program (Slutsky et al., 2019). A similar study found that there was no difference in the reduction of stress between an in-person and online program (Wolever et al., 2012). This suggests that mindfulness programs delivered virtually to employees working from home may be viable and effective.

In addition to mindfulness-based programs, positive psychology interventions can be adapted to protect employees from the harmful effects of work-related stress. For example, workers that reflected daily on three good events that happened during the workday over the course of one-week experienced reduced stress and reported a greater ability to detach from work in the evening (Bono et al., 2013). Beyond reflection, engaging in a ritual or routine while commuting is suggested to help employees manage their stress (Gino et al., 2017). Although employees do not commute when working from home, setting time aside for a morning routine may help workers reap the benefits of this process. Lastly, research has demonstrated that feeling connected with nature is associated with improved well-being (Cervinka et al., 2012). Indeed, the mere presence of an indoor plant at a workstation can help reduce employees' stress (Toyoda et al., 2020). Employers may consider providing their employees with small plants as a simple intervention to mitigate the harmful effects of work-related stress.

Encourage breaks from work. The positive relationship between taking breaks from work and employee well-being have been found in a variety of settings, such as taking micro-breaks, lunch breaks, weekends off or vacations (Bennett et al., 2020; Bosch et al., 2018; Ragsdale and Beehr, 2016; De Bloom et al., 2013). For example, introducing a company-wide policy of reducing the standard 1-hour meeting to 45 minutes (NU, 2021) is a promising avenue to not only help with productivity, but to free up time for micro- breaks. Designating meeting-free time during lunch hours signals to employees to take a break, eat lunch, and spend some time outdoors as exposure to nature has been shown to have a close association with happiness and life satisfaction (Capaldi et al., 2014; McMahan and Estes, 2015).

While micro-breaks and lunch breaks are taking place during work hours, employers also have leverage over how much time employees spend resting outside of work hours. Even though vacations boost happiness, productivity and creativity, and have also shown to reduce the likelihood of developing mental health issues (Carmichael, 2015), over half of all American employees reported having unused vacation days at the end of the year (US Travel, 2019). Organizations can encourage employees to take their vacation days by requiring employees to take time off (Perlow and Porter, 2009), or, borrowing from the vaccination literature, by defaulting employees into vacation days (Chapman et al., 2016). Depending on the industry, default scheduling of vacation days can be coordinated so that every employee is off at the same time, or phased out to ensure critical business functions are maintained at all times. Alternatively, limiting the number of days that can be rolled over to the next year, limiting pay-outs for unused vacation days, and making sure employees are sufficiently trained to take over tasks of a vacationing colleague can encourage the uptake of time-off.

Overcoming meeting fatigue. The number of attended meetings on a workday is positively related to feelings of fatigue and heightened subjective workload (Luong and Rogelberg, 2005). While this has been found in pre-COVID-19 times, the inevitable use of teleconferencing while working from home can be additionally tiresome for employees. This has been labelled as ‘Zoom fatigue’ and can occur due to, for example, missing body language, lack of synchronous cues, distractions due to additional chats and varying sizes of speaker screens (Morris, 2021; Wiederhold, 2020). Virtual reality could tackle some of these components by providing the possibility to communicate non-verbally, for example, by avatars that mimic body language. Companies could also encourage employees to have non-screen breaks between meetings (Reinach Wolf, 2020; Wiederhold, 2020) or implement a meeting-free week as has been recently done by a Dutch health insurer (NU, 2021).

Concluding remarks

Many organizations have traditionally supported their employees' physical and mental health through a variety of office-based programs and interventions. While the COVID-19 pandemic has led to a sudden shift from in-office work to working from home, part-time working from home is likely to persist after the crisis subsides as it is preferred by most employees and employers (Parker et al., 2020).⁸ The shift towards a hybrid model requires organizations to update their toolbox to continue supporting a healthy workforce. This paper has reviewed research on successful interventions related to physical and mental health and has discussed how organizations could adapt these interventions to a home-based office environment.

While the focus of the paper is on organization-led interventions, researchers, health professionals, and legislators can also crucially contribute to a healthy home-based workforce. First, more research is needed to verify that the adaptations of existing interventions work as expected in a home-office environment. Researchers should also explore new interventions that leverage the specificity of the home-office and the technological advancements that are being developed to facilitate the work-from-home transition.

Second, health professionals could improve home-based workers' health in complementary areas. While organization-initiated interventions can improve physical activity, nutrition, loneliness, and stress, other critical issues, such as addictive behaviour, might become more severe when employees work from home.⁹ Since the nature of these problems is too complex to be autonomously handled by organizations, these areas require specialized medical monitoring and intervention by health professionals.

Lastly, legislators can play a crucial role in improving the health of employees working from home. Some key aspects of health and well-being of the workforce can be protected more effectively at the legislative rather than the organization level. In most countries, specific legislation protects workers' rights to a safe and healthy workplace

⁸ Allowing employees to work from home part-time can make employees less stressed, happier, more loyal to employers, and better able to achieve a good work-life balance (OWL Labs, 2019). However, the optimal amount of time spent working at home is unclear; engagement is suggested to be highest when employees spend three to four days out of a five-day workweek working from home (Hickman and Robison, 2020), while job and life satisfaction seem to be highest when working from home for two days per week (Shockley, 2014). More than 2.5 days of work-from-home a week may benefit work-family relationship, but harm relationships with co-workers (Gajendran and Harrison, 2007).

⁹ Recent evidence suggests that alcohol and drug consumption, as well as smoking, has surged in connection to the COVID-19 pandemic (Dubey et al., 2020). It is unclear to what extent the surge in addictive behavior will persist after the COVID-19 pandemic is over, although the link between isolation and addictive behaviour warrant attention (Hosseini et al., 2014).

environment. Some of these regulations (e.g., those concerning workplace ergonomics and employer's liability insurance) may need adaptation and extension to the home-office environment. More specifically, legislators should verify that the responsibility of employers is clarified and potentially extended to make sure employees are insured against injuries incurred when working from home and that home-offices are safe and conducive to their health and well-being.

As office-based work transitions to a hybrid home and office-based model, organizations have the unique opportunity to critically examine ways to maintain and improve their employees' health from a distance. We hope this paper offers a starting point for doing so, providing organizations, managers, policy makers, and health professionals with a set of behavioural interventions to make the home-office a viable and healthy alternative to traditional office-working in the long run.

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