



move at WORK

Report on the evaluation and measurement of the impact of a physical activity policy in the company



**Co-funded by
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Background: The Move At Work Project

Co-funded by the Erasmus+ Programme of the European Commission, Move at Work – M@W is a three-years European project led by the European Federation for Company Sport – EFCS.

Move at Work (M@W) is the follow-up project of WAC – Workplace Active Certification rewarding professional organisations implementing physical activity for their employees.

The main objectives are to:

1. Develop tools that promote and educate on the benefits of implementing physical activity in the workplace
2. **Support public and private organisations** in integrating physical activity strategies into their business' policy
3. **Consolidate the workplace active certification** and adapt the needs based on end-users analysis

Activities:

- Creating an **online platform and a digital educational programme (MOOC)** to educate, train, and democratise the implementation of company sport.
- Hosting **conferences**: one held during the European Company Sport Games in Bordeaux (in June 2023), and another one in Brussels in 2025, in order to introduce major outcomes and results of the project.
- Creating and organising a network of company sport ambassadors and major stakeholders.

Executive Summary:

- This toolkit and report detail strategies for designing and evaluating workplace physical activity promotion programmes.
- The report emphasizes the importance of clear programme goals for effective evaluation, noting that programmes lacking clear objectives are less successful. Evaluating such programmes often relies on subjective methods like questionnaire surveys due to practical constraints in workplaces. Despite limitations such as interpretation issues and participant bias, these subjective measures are widely used and scientifically validated.
- The report discusses common evaluation methods and offers a toolkit for designing and implementing workplace physical activity programmes. It stresses the significance of clear objectives and provides accessible evaluation strategies.

Summary of Guidance on implementation of Physical Activity Programmes in the workplace:

- In their 2020 report, Evans et al. reviewed research on workplace physical activity programmes, identifying key elements for effectiveness.
- Programmes with clear theoretical foundations and specific objectives tailored to employee needs are more successful. Conversely, programmes with vague health goals or unrelated outcomes are less effective due to measurement challenges.
- Tailoring activities to specific job roles, such as stress reduction for nurses or injury prevention for construction workers, enhances impact.
- Effective programmes align with organizational culture, encouraging ownership, resource use, and policy integration. Programmes should consider local environments, workforce timing, and characteristics.
- Implementation often follows the Socio-Ecological Model, which considers individual, interpersonal, organizational, community, and societal factors influencing behavior.
- This model acknowledges personal attributes, social relationships, organizational policies, community surroundings, and broader societal influences on physical activity.
- Understanding these levels helps design programmes that leverage social support networks, provide access to services, and align with cultural, economic, and political contexts.
- Overall, successful workplace physical activity programmes integrate tailored activities with organizational culture and broader societal factors, enhancing employee well-being and engagement.

Summary of Workplace Physical Activity Programmes Implementation Procedures:

- The guide offers a comprehensive approach to setting and achieving goals in workplace physical activity programmes, crucial for enhancing employee health and productivity in the following steps;
 1. Conducting a needs analysis helps prioritize essential programme elements and evaluate existing resources.
 2. Defining objectives that are specific, measurable, achievable, relevant, and time-bound (SMART) is essential, focusing on outcomes like increased physical activity participation and improved well-being.
 3. Engaging employees in the goal-setting process increases motivation and ownership.
 4. Establishing both individual and collective goals tailored to diverse employee needs fosters inclusivity and participation.
 5. Providing resources such as fitness equipment, wellness programmes, and educational materials supports goal achievement.
 6. Monitoring progress through various measurement tools like fitness trackers and activity logs ensures programme effectiveness and allows for necessary adjustments. Evaluation should be ongoing, with flexibility to adapt goals based on feedback and changing organizational priorities.
 7. Recognizing and celebrating individual and collective achievements reinforces positive behaviors and cultivates a culture of health and wellness in the workplace.

- Additionally, practical recommendations from Evans and colleagues (2022) include utilizing signage for promotion, encouraging active commuting, implementing walking interventions, and providing group counseling.
- Multi-component interventions incorporating physical activity promotion alongside organizational changes prove most effective, often leading to additional health benefits.
- Expert support and health screening can enhance programme effectiveness, although ethical considerations regarding employee privacy arise.
- Overall, a holistic approach integrating goal setting, resource provision, monitoring, and evaluation is essential for successful workplace physical activity programmes.

Summary of Tools to Measure Physical Activity Programme Effectiveness:

- The report discusses various measurement tools to evaluate the efficacy and impact of workplace physical activity programmes.
- Previously measured outcomes include physical activity levels, work performance, fitness, motivation, nutrition, management support, anthropometric measurements, biochemical parameters, work-related outcomes, and health-related quality of life.
- Tools for assessing these outcomes range from biological and electronic measures to subjective techniques like surveys and questionnaires. The former can be more accurate, but lack utility in community settings, and are expensive. Conversely subjective measures, although often less accurate, offer a greater degree of flexibility and are relatively easy to implement.
- Overall, a combination of measurement tools is necessary to comprehensively assess workplace physical activity programmes and their impact on employee health and performance.
- One way to select questionnaires to utilize is to align their use with an assessment framework. Two such Frameworks are outlined, including the Workplace Active Certification programme and “Physical activity in the workplace” published by Exercise & Sports Science Australia (ESSA)
- Questionnaires to measure physical programme impact are also outlined, including the following:
 - For physical activity measurement:
 - The International Physical Activity Questionnaire (IPAQ): Long Form
 - The International Physical Activity Questionnaire (IPAQ): Short Form:
 - The occupational sitting and physical activity questionnaire (OSPAQ):
 - The General Physical Activity Questionnaire (GPAQ)
 - The Recent Physical Activity Questionnaire (RPAQ)
 - For Workplace Performance:
 - The Workforce Sitting Questionnaire (WSQ):
 - Health and Work Questionnaire (HWQ)
 - The Worksite Health Promotion Capacity Instrument (WHPCI):
 - The Work Productivity and Activity Impairment Questionnaire (WPAI):
 - The Job Satisfaction Survey (JSS):
 - The General Health Questionnaire (GHQ):

Introduction: The implementation and evaluation of workplace physical activity programmes.

The following toolkit and report outlines methods that have been adopted in order to design and measure the effectiveness of physical activity promotion programmes in the workplace.

The report begins by describing common practices in workplace physical activity programme implementation, before giving examples of accessible and more easily applied methods of evaluating impact on physical activity participation levels and work effectiveness.

Workplace physical activity programme evaluation relies upon the clear expression of programme goals. Ideally, it would also relate to programmes with a clear underpinning rationale; in other words, programmes with clear objectives, and a stated reason for why those objectives were chosen, are easier to evaluate.

Conversely, evidence suggest that programmes that lack clear goals, or programmes that implement physical activity programmes as part of general ‘health’ or ‘wellbeing’ policies tend to be less effective, not least because their impacts are harder to measure in relation to specific targets.

For programmes with clear goals or objectives, the most accessible methods of evaluating workplace physical activity programme impact are subjective and self-report methods, commonly questionnaire surveys. The alternatives (for example, taking objective or biological measures) are impractical in most workplaces.

Although subjective or self-report methods are widely used and relatively easy to analyse, they do have limitations. These limitations include;

- Possible interpretational problems with questionnaire instruments,
- Participants over- or under-estimating the amount of physical activity they participate in, or
- Participants offering mixed levels of engagement with questionnaires when asked to complete them on a voluntary basis.

Despite these weaknesses, many subjective measures of workplace physical activity programme impact have been scientifically validated; in other words, they have been tested and have been demonstrated to be scientifically effective in terms of reliability and validity.

Hence, the following report discusses the most widely used of these methods in relation to measuring specific impacts.

Prior to this discussion, however, the report begins by offering a toolkit concerning the factors to consider when designing and implementing a workplace physical activity programme.

What is Company Sport?

Company sport has been practiced since the end of the 19th century, and began with automobile companies, who used sport as a management policy. Company sport was initially founded in France and the United States, following a desire on the part of industry leaders to improve the health conditions of their workers. Examples of early company sport programmes include those implemented by Michelin in Clermont, Peugeot in Sochaux and Fiat in Turin. In the 1980s, with the tertiarisation of society, sport also became acknowledged as a tool for managers to also foster good company morale, encourage employee qualities, such as leadership, and to develop a competitive spirit.

Today, issues such as improving well-being and prevention of illness amongst employees and the general population have also become of paramount importance. Hence, in contemporary times, company sport can encompass a range of activities, programmes and leisure activities that are linked to broader concepts such as sport, physical activity, sedentary lifestyle, inactivity, corporate sport, mobility, and health, for example. The following list of terms will help an employer to define specific objectives that are relevant to the aims of a company.

1 - Company sport: Physical activities, sports, exercise and other movement that is accessible to all, to the benefit of their health, well-being and the inclusiveness of participants, in order to improve the global efficiency of the company itself.

2 - Sport in workplace: In general, this concept includes all physical activities, sport and exercise within the company and beyond. Such activities might include group classes given by a coach directly at the workplace, or any sport activities organized by the company according to its infrastructures and equipment.

3 - Physical activity: Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure. It can be categorized into occupational activities, sports, conditioning or exercise, household or other activities. In company sport, this term is used to define an activity that involves body movements that are accessible for everyone. For Joe Piggin (2020), a broader definition for physical activity might be as follows:

Physical activity involves people moving, acting and performing within culturally specific spaces and contexts, and influenced by a unique array of interests, emotions, ideas, instructions and relationships.

4- Sport: A competition or activity needing physical effort and skill that is played or participated in according to rules, for enjoyment and/or as a job.

5 - Productivity: At the corporate level, productivity is a measure of the efficiency of a company's production processes. It is often calculated by measuring the number of units produced relative to employee labour hours or by measuring a company's net sales relative to employee labour hours.

6 -Cohesion: In a business context, a cohesion group exhibits several distinctive characteristics that set it apart and help maintain its effectiveness and harmony. Building group cohesiveness refers to the process of fostering a sense of unity, shared objectives, mutual trust, and strong interpersonal bonds within a group.

7- Team building: The practice of promoting good working relationships among the members of a group, often through activities and events designed to encourage cooperation.

8 - Well-being: Is generally defined as the state of feeling healthy and happy. _

9- Quality of life at work (QWL) : The QWL is often perceived as a "suitcase word" within which all actions related to well-being at work can be grouped together. It stems from an awareness of the need to take into consideration the well-being of company personnel in their daily missions. The Workplaces ranking from great place to work is a good tool for finding out which companies are concerned about quality of life at work.

10- Workplace Wellbeing : Relates to all aspects of working life, from the quality and safety of the physical environment, to how workers feel about their work, their working environment, the climate at work and work organization.

11- Sedentary behaviour: Sedentary behaviour is any activity involving sitting, reclining or lying down for long periods that uses very little energy.

12- Inactivity: Physical inactivity is when the physical activity guidelines recommended by experts are not met. Those who do not get the recommended level of regular physical activity are considered 'inactive', as they experience a lack of exercise and movement.

13- Absenteeism: Absenteeism is when an employee does not turn up for work consistently over a period of time with little or no explanation. The concept does not apply to things like planned time away, various types of illness or familial emergencies.

14 - Company/ organization: A company is an entity created for the purpose of producing goods or services for the market, which may be a source of profit or other financial gain for its owners. Organization is a group of people that works together for a particular purpose. Most of the time organizations are non-profitable. Both are entities that can be involved with company sport.

Guidance on implementation of Physical Activity Programmes in the workplace:

In a report conducted in 2022, Evans and colleagues completed a review of review papers that evaluated which components of workplace physical activity programmes were most effective. The authors also evaluated numerous practical guides and policy documents relating to the best ‘active ingredients’ for such programmes. They made the following key recommendations:

- Programmes that have a **solid theoretical foundation or rationale** (i.e. they have a strong rationale to underpin programme plans and choices), and programmes which have **explicit and specific objectives** that are linked to this theoretical foundation, tend to be **more effective**. Programme theories or rationales do not need to be overly complex; for example, they might relate to how to meet the specific needs and challenges faced by a given workforce or company (e.g. to offer stress reduction programmes for healthcare workers, or flexibility exercises for physical labourers).
- Conversely, programmes that aim for ill-defined or general 'good health' or wellbeing outcomes, or which conflate physical activity with promotion of other healthy behaviours (such as healthy diet or sedentary behavior reduction), are less likely to achieve impact. In part, this is because general outcomes are harder to measure and assess.
- Programmes which implement **specific forms of physical activity aligned to the needs of specific employee groups, tend to be more effective** than programmes which promote a generic physical activity plan. For example, programmes which implement stress-reducing activities (e.g. yoga or flexibility programmes) are more suitable for high-pressure job roles like nursing. Conversely, injury-prevention programmes are more effective for those at risk of physical harm at work, such as construction workers. Moreover, cardiovascular exercise or sports programmes can often be effective for those in sedentary jobs, and where development of a team ethic is a key objective (e.g. for office workers).
- Additionally, the **most effective programmes are tailored to their context or organizational culture**. This tailoring can occur across various levels, including individual, interpersonal, organizational, and policy dimensions. Such programme design could include fostering ownership over programmes amongst employees, promoting effective use of existing resources and infrastructure, promoting positive choices within the workplace, encouraging team-based physical activities, fostering a supportive organizational culture that integrates

physical activity into the workday, incorporating physical activity goals into company policies, and extending partnerships and facilities beyond the workplace.

- It is also important to **consider local environmental and policy factors** and to utilize partnerships and policies beyond the workplace. Programmes should also align with the timing and needs of the workforce, taking into account workplace characteristics such as organization size and type of work.

The most commonly utilized model for programme implementation is the Socio-Ecological Model (see fig 1 below). Socio-ecological models are frameworks typically used in various fields such as public health, psychology, sociology, and environmental studies to understand the complex interactions between individuals and their social and physical environments. Such models recognize how human behaviours are influenced across multiple levels, ranging from individual characteristics to broader societal factors. Typically, such models include five interconnected levels:

1. At the individual level, the focus lies on personal attributes like knowledge, attitudes, beliefs, and actions about physical activity and health and well-being.
2. The interpersonal level examines how relationships with colleagues, family, friends, peers, and social circles influence an individual's behaviour and physical activity/health levels.
3. On the organizational level, entities such as schools, workplaces, and community organizations influence physical activity participation through their policies, procedures, and social conventions.
4. The community level encompasses the physical and social surroundings in which individuals reside, and within which opportunities to be physical active might exist. Such factors might include the possibility to engage in active commuting, external sports clubs or organisations, or to engage in membership of gyms, health clubs or other facilities. These elements can shape health-related behaviors and outcomes by providing access to services, fostering social support networks, and establishing organisational norms.
5. Lastly, social factors encompasses broader societal elements such as cultural standards, economic regulations, and political structures that influence opportunities to be active. At this level, it is important to recognised policies and laws that might support programme implementation.

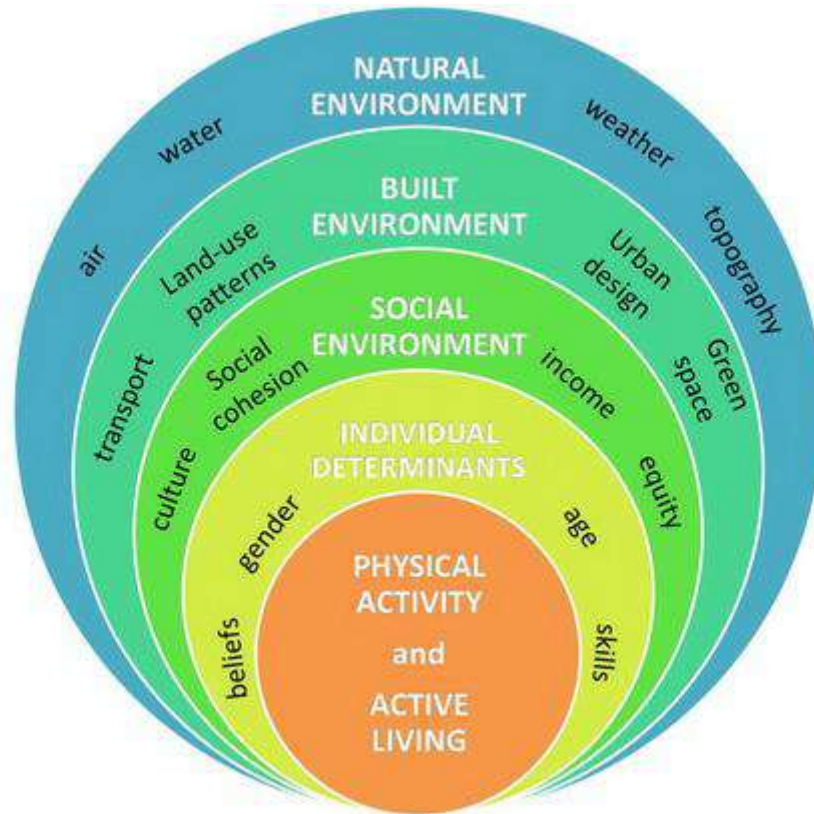


Fig 1: Socio-Ecological Model, Adapted for Physical Activity (Özdemir 2012, Adapted from Dahlgren and Whitehead 1991)

In terms of workplace physical activity programmes, socio-ecological models help implementers to understand how programmes can target multiple levels of influence. By understanding how these different levels interact, interventions and policies can be developed to promote positive outcomes at individual, interpersonal, organizational, community, and societal levels.

Hence, implementation of workplace physical activity programmes requires careful planning and consideration of the antecedents, or contexts, within which workplace physical activity programmes are implemented. It is to outlining how to perform assessment of these antecedents (through needs analysis) that this toolkit now turns.

Workplace Physical Activity Programmes Implementation Procedures:

Physical activity programmes in the workplace are essential for promoting employee health, productivity, and overall well-being. Setting clear and achievable goals is crucial for the success of these programmes. This guide provides a step-by-step approach to goal setting in workplace physical activity programmes, ensuring they are effective and beneficial for employees.

1. Analyse Needs (Needs Analysis):

Before setting goals for your physical activity programme it is important to assess the current physical activity levels and health status of employees. It is important to differentiate between needs (essential elements or desired outcomes of a programme) from wants (i.e. non-essential outcomes that might, nevertheless, be beneficial). Where prioritization must occur, for example in allocating time or resources, needs should take priorities over wants.

Needs analysis can be achieved through consultation with both employees and exercise professionals, and/or employment of the evaluation tools (i.e. questionnaire surveys) outlined below. It is then possible to compare existing (or pre-programme) physical activity and productivity levels with post-programme ones.

It is also important to audit existing resources, facilities, and support available for implementing physical activity programmes in the workplace. One way to conduct such an audit would be to engage with the Workplace Accreditation Certification Process, and details of this programme are outlined below in part two of this report.

2. Define Objectives:

Once evidence of need is established and resources audited, it is important to clearly define the objectives of the physical activity programme. Objectives should align with the organization's overall goals, such as improving employee health, reducing absenteeism, increasing physical activity participation, reducing sedentary time, or enhancing team morale.

Objectives should be specific, measurable, achievable, relevant, and time-bound (SMART), and related to the needs of the workforce in question.

Typically, those implementing workplace physical activity programmes have focused upon outcomes or objectives including:

- Physical Activity Participation rates
- Time spent doing sedentary activities
- General wellbeing or general health
- Worker absences

- Job Satisfaction (or other measures or work-related satisfaction).

Key predictors of physical activity adherence include employees' self-efficacy, perceived benefits, and perceived health status. While socio-demographic factors may have some influence on participation, the evidence for this is mixed at best.

It is also important to involve Employees in programme design, particularly through consulting with them concerning their specific needs and objectives. Involving employees in the goal-setting process is also likely to increase engagement and motivation. To this end, it is advised to conduct focus groups, surveys, or convene meetings to gather input and preferences regarding physical activity initiatives.

3. Define organizational and individual goals:

Once objectives have been defined, it is important to establish both individual and collective goals to cater to the diverse needs and preferences of employees. It might also be helpful to engage workplace physical activity champions or gatekeepers, so that a sense of shared ownership over goals can be developed.

Individual goals may include increasing daily steps, reducing time sitting, attending fitness classes, or achieving specific fitness milestones. Collective goals could involve team challenges, group workouts, or participation targets for company-wide events.

Goals should be tailored to employee needs. It is therefore important to conduct needs analysis to enable consideration of the demographics, fitness levels, and interests of employees when setting goals. Goals can also be tailored to accommodate different job roles, schedules, and physical capabilities within the workforce.

Examples of appropriate programme goal setting:

In order to illustrate this crucial aspect of programme development through real-life examples, we can largely lean on evidence-based inputs presented during WAC certification proceedings when considering what type of goals are appropriate. Differing events or activities are probably necessary to attract as broad a range of participation as possible.

Certain companies are daily engaged in a competitive business environment and therefore it is tempting to set up “challenges” on a regular and competitive basis. However, a lot of feedback has indicated that this can lead to a polarizing effect and caters often to the “fit and active” employees to the detriment of the less active. Careful design of challenges to include contributions and participation of more sedentary or inactive personnel is important in reaching out to this segment of the workplace population.

Care should also be taken to provide regular participation of “outlying employees,” who may be either geographically isolated, home-workers, itinerant staff, etc.

Typical examples which only require simple means of implementation are periodic “walking challenges” or “take-the stairs challenges” organized in teams or “service-vs-service” where just about all persons can contribute depending on their capacity.

Another example is the “Course de la Diversité” (Race for Diversity) developed by the French Company Sport Federation, through a “walking or running” event. Here, participants are placed in mixed teams (the elements of diversity can be diverse! e.g. age, hierarchy, handicap, etc.), and have to complete a distance (typically 3k and/or 5k) with no time-limit – the winners are all those teams that cross the designated finish line.

In the absence of any traditional “winners’ podium” at such events, an element of challenge is often introduced by incorporating a charity donation component which where a certain amount of money is donated for every team that finishes, etc.

On the other hand, many companies encourage milder forms of everyday exercise. Recently a senior executive recalled that while waiting for the elevator, many employees in that organization do a few “knee-bends” in the short waiting time. After overcoming the initial surprise when first proposed, today it is a regular sight.

Another company relates the usefulness of pre-shift warm-up sessions for employees involved in heavy maintenance tasks – in addition to a short convivial moment with colleagues, the positive contribution on work-related accidents has been measured over time.

A final example comes from a company which, like many others, organizes regular team-building and training sessions for its employees. However, they have to obey a golden rule “All sessions must incorporate a physical activity period”.

These examples serve to illustrate the endless possibilities of integrating different forms of physical activity and movement into the work world. As stated above, the needs and wishes of both the organization and the personnel need to be defined and stated in order to attempt to reach a mutually beneficial goals and outcomes.

4. Provide Resources and Support:

Once goals have been set, resources and programme possibilities recognized, and programme design has been completed, it is important to allocate resources, such as time, budget, and facilities, to support employees in achieving their goals. Such actions might including offering access to fitness

equipment (both within or outside of the workplace), sports, exercise or other recreational activities, offering access to wellness programmes, or providing educational resources to facilitate participation.

Evans and Colleagues (2019) also gave several recommendations concerning evidence focused upon practical considerations. These include:

- The use of signs, posters, and messages for promoting physical activity can yield minor effects, though evidence remains inconclusive.
- Interventions encouraging active commuting can lead to moderate enhancements in physical activity levels, particularly among more affluent demographics. Limited evidence suggests a direct impact on employee physical fitness.
- The effectiveness of walking interventions is disputed, with impacts generally considered to be minimal to inconclusive.
- Group counseling may result in low to moderate impacts, though evidence supporting this is once again inconclusive.

Interventions across several levels is advised. This is because multi-component programmes are linked to slight yet positive effects across various parameters, including activity behaviour, mental and physical health, and other psychological variables. Programmes tailored to employee needs prove more effective.

Overall, multi-component interventions incorporating physical activity promotion alongside organizational changes demonstrate the greatest effectiveness and often lead to additional health benefits. Chappell et al. (2016) suggest that workplace physical activity programmes could follow Kotter's eight steps for successful change, including creating a sense of urgency, forming a guiding coalition, developing a vision and strategy, communicating the change vision, empowering employees for broad-based actions, generating short-term wins, and anchoring new approaches in the workplace culture.

Moreover, expert support (i.e. working with exercise or health professionals) in programme delivery can heighten effectiveness. Health screening can also have an impact, but ethical concerns regarding employee privacy arise concerning how appropriate taking such data from employees is.

5. Monitoring and Evaluating Progress:

Once programmes are implemented, it is important to implement systems for monitoring and tracking progress towards goals. Crucially, measurements should align with the goals set, and allow the company to adapt and meet recognized needs as initially described. This could involve using fitness trackers, activity logs, or online platforms.

Measurements could range from simple records of participation, oral or written feedback on programme effectiveness from participants, or scientific tools, such as subjective questionnaires, designed to measure programme impact upon specific outcomes in a more robust manner. In the latter case, it is also highly likely to involve utilization of the measurement tools outlined below. It is important to regularly review and evaluate progress to identify areas for improvement and celebrate successes. A flexible approach is also advised in which goals can be adjusted based on feedback, changes in employee preferences, or evolving organizational priorities.

Finally, it is important to recognize and celebrate individual and collective achievements to reinforce positive behavior and foster a culture of health and wellness in the workplace. This might include offering rewards, incentives, or recognition ceremonies to acknowledge milestones and accomplishments.

Conclusions and recommendations concerning workplace physical activity programme design:

Setting goals is a fundamental aspect of workplace physical activity programmes. By following these steps and incorporating employee input, organizations can create meaningful and effective goals that promote a healthier and more active workforce. Regular evaluation and adaptation are key to ensuring ongoing success and sustainability of the programme.

As noted above, successful programmes often feature rigorous implementation designs, use comprehensive measurement tools, and utilize a theory or strategy for implementation and assessment. What's more, programmes that are monitored and evaluated efficiently are more likely to be effective.

Moreover, based upon the above evidence, Evans and colleagues (2020) made several recommendations for best practices at various levels:

1) At the environmental and national levels, and where possible, the programme should be integrated the programme into existing physical activity policies, laws, and provisions at local and national levels. In this respect, it would be worthwhile to seek support from national, regional, or local authorities for the programme. Furthermore, connecting programmes with the local community to as a link between company activities and external clubs, sport and exercise organisations, and associations, could be very fruitful. Finally, programmes which utilize available spaces within and around the workplace environment, such as hallways, stairs, and outdoor areas.

2) At the policy and cultural levels, programmes which establish clear accountability and responsibility mechanisms in delivery structures (e.g., through a board or council) are more likely to be successful. In other words, programmes which receive support at the managerial level are far more likely to succeed, particularly if this support leads to ownership across multiple levels of an organisation. Actions to incorporate physical activity into other organizational policies (e.g., regarding alcohol, smoking, or wellness) is also advisable, as is seeking to develop a business case for physical activity promotion with explicit goals and an implementation strategy, avoiding broad definitions of 'health.' Integration of physical activity into company practices and routines, including post-activity considerations (e.g., shower facilities for employees), is also advised. Finally, regular monitoring of programme effectiveness and the implementation of incremental, gradual changes is also advised (See below for recommended tools to achieve this).

3) At the managerial and organizational levels, demonstrating support and the active involvement in the programme among senior management is essential. What's more, provision of resources, including physical and time resources, to support programmes is considered essential. Management engagement and consultation with employees is also advisable, as is facilitating their involvement in decision-making processes and emphasizing the voluntary nature of the programme. To this end, employment of multi-strategy approaches across various levels of the company, including education, environmental changes, agreements, and providing care and guidance, also leads to greater programme impact. Finally, tailoring programmes to the workforce's specific needs using multi-component strategies is also essential. .

Part 2: Measurement Tools for Workplace Physical Activity Programmes:

Having outlined many of the considerations for programme design and implementation, it is now necessary to outline a range of available tools to evaluate programme efficacy and impact. The report below therefore outlines typical measurement parameters to assess programme impact, and the tools typically used to measure these parameters.

What outcomes have previously been measured in workplace physical activity programmes?

Several review papers exist that catalogue and describe the typical parameters that have been measured in terms of physical activity in the workplace. Typically, work performance and physical activity have been measured as separate domains; they have rarely been correlated within the same instrument. They have, however, been correlated within the same study by using different measures.

To this end, Johnson et al (2018) found 9 themed outcome measures across multiple studies. The primary consideration was Physical Activity Level, encompassing step counts, reduced sedentary activity, increased moderate to vigorous physical activity (MVPA), metabolic equivalents (METs), aerobic activity level, time spent in sporting activities, and active commuting. The other 8 themes included Fitness, Motivation/Involvement/Self-efficacy, Nutrition, Management Promotion Support, Anthropometric Measurements, Bio-chemical Parameters, Work-related, and Health-related Quality of Life (QoL)/Well-being. Fitness was distinguished from Physical Activity, but only found in systematic reviews with specific biological tests. Changes in physical activity level were the main inclusion criterion, measured in all studies. Anthropometric measurements were used in 65% of the studies, Health-related QoL in 60%, and work-related outcomes in 45%. Management involvement and nutrition were reported in 20% and 15% of the studies, respectively. Changes in physical activity levels were associated with other outcomes, such as improved sleep quality and lower absenteeism rates. Loitz and colleagues also found several types of tools, such as questionnaires and checklists, can be identified for assessing the impact of workplace factors on physical activity (PA) and sedentary behavior (SB) – but rarely simultaneously (Loitz et al., 2020).

The Development of measurement tools for these outcomes:

Loitz and colleagues (2018) examined processes involved in developing assessment tools in order to evaluate the clarity of their objectives, the evidence of validity and reliability, and the incorporation of theoretical frameworks. The extent of information provided about tool development varied, with some resources offering comprehensive descriptions and others providing minimal or no details (refer to Table 3 for reported information). Objectives varied based on Socio-Ecological Model (SEM) categories, specificity of health behavior (e.g., health, PA, SB, walking), and intended use (e.g., general assessment, pre-post intervention assessment, and workplace improvement guidance). Only 42.9% of

the tools reported validity or reliability evidence, and a mere 38.1% (8 out of 21 tools) incorporated that they had aligned their work to specific theories, frameworks, or models in their development.

The Socio-Ecological Model emerged as the most common theory/framework in the review due to its practicality in understanding the interconnected factors influencing workplace PA and SB. Tools based on the SEM can assess behavioural influences beyond individual factors, contributing to effective workplace health promotion. However, the review noted that only some tools incorporated selected aspects of the SEM, emphasizing the theory's continued relevance for workplace health promotion audit tools. Theory-driven evaluation enhances understanding, allowing for adjustments to meet workplace contextual needs. Despite the importance of theory, only a third of the audit tools in the review reported using a theory or framework, indicating a need for consistent reporting on theory usage.

Types of measurement tools available:

Johnson and colleagues (2018) categorized measurement of the above parameters into three types: biologic, electronic, and declarative. Biological tools included measures like blood glucose and monitoring body fat percentage. Declarative tools involved participant reports, such as perceived exertion or self-report questionnaires. Conversely Castillo Retamal et al (2011) grouped measures into workplace settings with objective techniques, workplace settings with subjective techniques, and laboratory settings with criterion standards. Of the 92 unique evaluation tools found, 27 were objective and 65 were subjective. Objective tools included biologic and electronic measures, making up 29.3%, while subjective tools, primarily surveys and questionnaires, constituted 71%. Physical activity was the main outcome, assessed using six objective and 20 subjective tools.

Workplace settings with objective measurement tools, such as electronic devices measuring step counts or activity levels, were highly effective at measuring results. For example, pedometer studies demonstrated an inverse relationship between workday step counts and sitting time, waist circumference, and blood pressure. In occupations with higher activity levels, such as blue-collar workers, significant differences in step counts were observed compared to less active occupations like university academics (Johnson et al 2018, Castillo Retamal et al 2011).

Criterion standards for measuring physical activity include direct observation, doubly labelled water (DLW), and indirect calorimetry. Direct observation involves witnessing and recording physical activity behavior, while DLW uses an isotope dilution technique to estimate total caloric expenditure. Indirect calorimetry estimates energy expenditure by measuring respiratory gases. Although criterion standard measures provide valid and accurate information about energy expenditure, they have limitations such as feasibility issues in large samples, limited applicability in the community setting,

short-term applicability, and potential disruptions to work productivity. Their application is therefore largely limited to academic studies.

Most common, however, were subjective measurement tools, including self-reports via interviews, surveys, and questionnaires. Such measures are commonly used to understand variables associated with physical activity. In the workplace, subjective techniques such as surveys have been employed without significant disruption to work duties. These measures provide information about behavioral and psychological variables related to physical activity and sitting time, allowing for the assessment of large samples simultaneously (Castillo Retamal et al 2011). Studies using subjective measures include mean occupational sitting time, calculated energy expenditure (expressed in METs), time spent in physical activity, and the proportion of participants engaged in different workplace activities. For instance, Mummery et al. found through a survey in Australian communities that mean occupational sitting time was over 3 hours per day, higher in men than women, and significantly associated with BMI > 25 in men. Other studies, such as Kaleta (et al. 2006), Steele and Mummery (2003), and Kruger (et al., 2006) utilized questionnaires to explore various aspects of occupational physical activity. These studies investigated associations between variables like energy expenditure of occupational physical activity, job-related physical activity, and sedentary behavior. Steele and Mummery also highlighted differences in physical activity engagement across occupational categories, showing varying levels of activity participation among blue-collar, white-collar, and professional workers.

Although there can be weaknesses in the self-report method, subjective measures of physical activity in the workplace have contributed to understanding relationships among demographic, social, economic, and behavioral factors, identifying potential contributors to unhealthy behaviors. For example, Kaleta and colleagues (2006). analyzed variables impacting BMI > 25 in men, revealing associations with age, lack of recreational physical activity, low education, low income, and a history of smoking.

Loitz and colleagues (2020) similarly described how subjective measure tool length varied from 4 to 62 items, employing diverse response formats such as Likert scales, dichotomous responses (yes/no), and open-ended formats. The predominant categories within the Social Ecological Model (SEM) were policy and environmental influences. Policies ranged from facilitating access to PA professional services (e.g., exercise classes, lifestyle coaching) to encouraging active commuting (e.g., flexible hours, transit passes). Environmental constructs encompassed social and physical aspects, evaluating factors like the indoor office environment, outdoor worksite conditions, social workplace dynamics, and worksite safety. Most tools did not distinguish between PA and SB in their items, scoring, or interpretation, posing challenges in providing specific feedback and measuring workplace improvements.

Recommended Measurement Tools

In order to assess the correlation between physical activity and work performance, it is necessary to measure both variables using valid and reliable tools and methods. Typically, subjective measures are the most readily available, cost-effective and most widely applied, even though by definition they rely upon self-report methods. Nevertheless, particularly when validated against objective of criterion measures, such tools can be helpful. Some of the common subjective tools and methods for measuring physical activity and work performance are described below.

General Guides to Promoting Physical Activity in the Workplace

Several general guides exist that outline good practices and considerations for implementation of workplace physical activity programmes. Several of these are linked to the process of assessing needs, or auditing existing services and programmes. Foremost amongst these is Workplace Active Certification, although several guides exist. These are outlined in brief below.

The Workplace Active Certification (WAC)

Co-funded by the Erasmus+ Programme of the European Union, Workplace Active Certification (WAC) was a two-year project (2020-2022) designed to set up, test and launch a certification process for companies. The WAC project is a direct continuity of EMOCS – European Meetings of Company Sport – which showed the potential and need to develop a recognition for companies promoting health-enhancing physical activity in and around the workplace. This aligns with a long-standing EU policy set out in the “EU Physical Activity Guidelines- Recommended Policy Actions in Support of Health-Enhancing Physical Activity” which was approved by the EU Working Group "Sport & Health" on September 25, and subsequently confirmed by EU Member State Sport Ministers. In chapter 3.5 of this document dedicated to the “Working Environment” we find 2 main recommendations (Guidelines for Action Nos 33 and 34) which state:

Guidelines for Action

- Guideline 33 – In their agreements, employers and trade unions should include requirements for the workplace which facilitate a physically active lifestyle. Examples of such requirements include: (1) Access to adequately equipped indoor and outdoor exercise facilities; (2) Availability, on a

regular basis, of a physical activity professional for joint exercise activities as well as for individual advice and instruction; (3) Support for workplace-related sport participation; (4) Support for using cycling and walking as transportation to and from the workplace; (5) If the work is monotonous or heavy to the extent that it implies an increased risk of skeletal muscle disorders, access to exercises specifically designed to counteract these diseases; (6) A physical activity-friendly working environment.

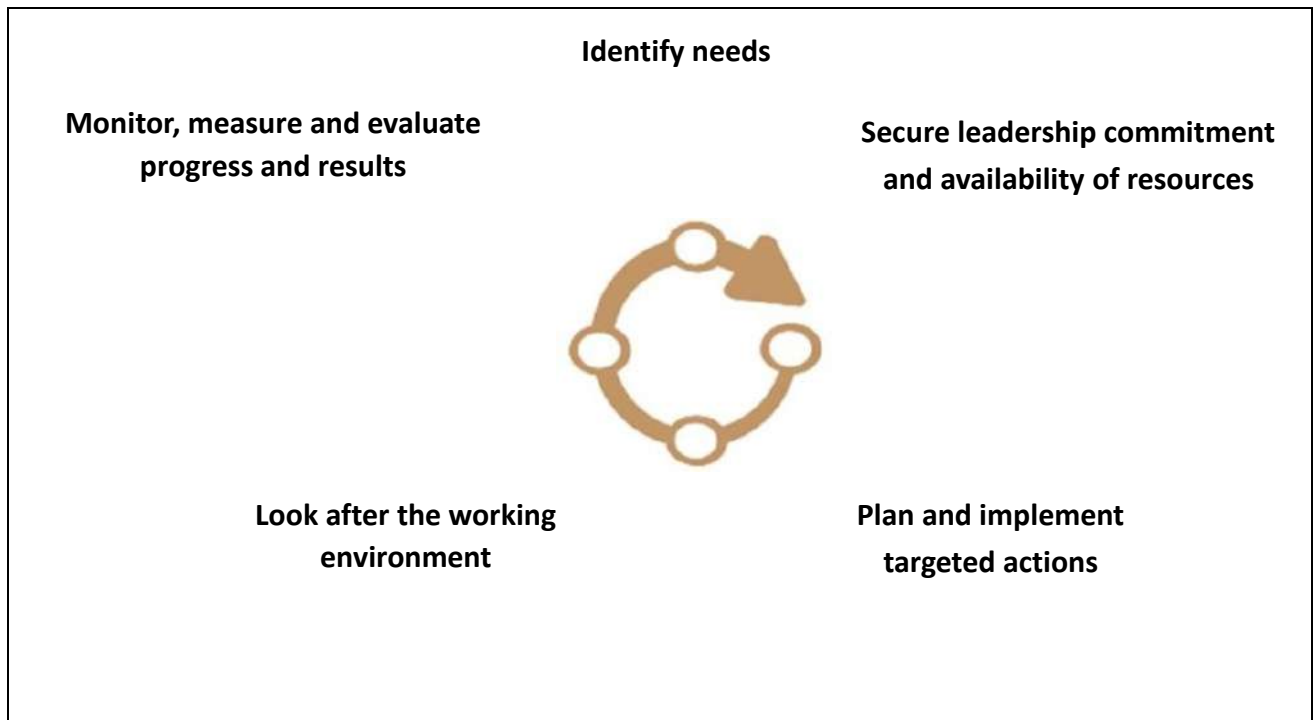
- Guideline 34 – National health certificates could be awarded to workplaces where a healthy physically active lifestyle is given high priority.

The remit of the European WAC programme can be summed up as a project to create a durable, credible and reliable certification programme for workplaces at the European level regarding physical activity at work. And the key outputs included the design and pilot phase of a certification scheme applicable to “workplaces” of all types, based on three underlying design principles - 1) Build on what already exists; 2) Adapt goals to the context and available resources; and 3) Experiment, evaluate and progress over time.

The following table provides a rapid overview of the approach taken when creating the WAC scheme.

WHO ?	A collaborative and creative programme involving 28 companies and 42 experts across Europe, co-funded by the Erasmus+ Programme of the European Commission
WHAT ?	A remit to create a “durable, credible and reliable certification programme for workplaces at a European level regarding physical activity at work”
WHEN ?	Developed over the last 5 years, the first round of 13 WAC certified companies from 5 countries were recognized in October 2022 in Brussels during a rewards ceremony.
WHERE ?	Now open to organisations of all types and sizes which promote and actively engage in developing physical activity for their employees in connection with the workplace
HOW ?	By means of a formal company certification scheme, based on existing best practices, standards and recognized expert methods set out in 22 separate criteria

Twenty two criteria were retained as being essential components to be implemented by organization desiring to promote physical activity in the workplace, and these are grouped under 5 headings :



Further details on the criteria and the advantages of adopting the WAC scheme are available at <https://activeworkplacecertification.eu/>

Further general guidelines

Of course, this is not the only scheme designed to promote the implementation of workplace physical activity, in fact there are many others. A considerable number of Guideline documents offering tried-and-tested approaches can easily be accessed on the internet. For the sake of brevity, we'll will only offer pointers to a couple of such documents:

“PHYSICAL ACTIVITY IN THE WORKPLACE” published by Exercise & Sports Science Australia (ESSA), Exercise Is Medicine® (Australia) together with Healthier Australia Commitment.

Although primarily oriented to the Australian workplace, this a comprehensive document outlining justification and potential benefits at all levels of promoting physical activity within and around the workplace. Of special interest are the two appendices :

- Appendix A. EIM organisation Policy and support Audit tool
- Appendix B. EIM (workplace) environmental Audit tool

Another readable set of guidelines is contained in the Canadian publication ‘Alberta Health Services & Centre for Active Living - Active Workplace Audit Toolkit’. In spite of its name, it contains much more than an “audit toolkit” and deals with the Physical Activity programme design, implementation and evaluation based on the well-known ‘Plan-Do-Check-Act’ approach familiar to many companies.

Finally, the European Commission’s own work on this subject can be cited through published papers such as “Physical activity at the workplace - Literature review and best practice case studies : a final report to the European Commission”, which can be accessed at

<https://op.europa.eu/en/publication-detail/-/publication/9fc2b8a0-e537-11e7-974...>

This publication provides an overview of best practices on physical activity in the workplace, including case examples. It identifies which types of workplace physical activity interventions are effective in changing physical activity behaviour in different work sectors and types of workplace.

Tools to assist in the measurement of these impacts will now be outlined.

Tools to Measure Physical Activity:

Physical activity can be measured using objective or subjective methods. Objective methods are methods that use devices or instruments to record or monitor physical activity, such as accelerometers, pedometers, heart rate monitors, or GPS. Subjective methods are methods that use self-report or proxy-report to estimate or recall physical activity, such as questionnaires, diaries, or interviews. Some examples of validated questionnaires to assess physical activity in the workplace are:

The International Physical Activity Questionnaire (IPAQ):

This is a questionnaire that measures the frequency, intensity, and duration of physical activity in four domains: work, transport, domestic, and leisure. It has been validated in 12 countries and can be used for cross-cultural comparisons (Craig et al., 2003). It has two forms.

IPAQ Long Form:

Overview of the Measure: The International Physical Activity Questionnaire (IPAQ) is a set of four questionnaires that measure health-related physical activity across different domains and settings. The IPAQ instruments were developed in 1998 and tested for reliability and validity in 12 countries and 14 sites in 2000. The results showed that the instruments have acceptable measurement properties for international comparisons.

Questionnaire Format: The IPAQ questionnaires ask about the time spent on different types and intensities of physical activities in the last seven days, such as work, transportation, housework, and leisure. The questionnaires also ask about the time spent sitting on weekdays and weekend days.

The IPAQ instruments are recommended for use in national prevalence studies of physical activity, and should not be modified in wording or order. The instruments can be translated from English using a prescribed back-translation method, and the translated versions can be contributed to the IPAQ website.

Validation: The IPAQ process is an ongoing international collaboration, and an International Physical Activity Prevalence Study is in progress. More information and publications on IPAQ can be found on the IPAQ website.⁶⁷

IPAQ: Short Form:

Overview of the measure: The International Physical Activity Questionnaire - Short Form (IPAQ-SF) is a tool to assess the intensity and duration of physical activity and sitting time in different domains of daily life.

Questionnaire Format: The IPAQ-SF consists of 7 items that ask about the frequency and duration of vigorous, moderate, and walking activities, and sitting time in the last 7 days. The total physical activity is calculated in MET-min/week.

The IPAQ-SF is designed for use with young and middle-aged adults (15-69 years) and can be self-administered, orally administered, or administered by telephone. The IPAQ-SF is available in English and many other languages on the IPAQ website, where guidelines for data processing and analysis are also provided.

Validation: The IPAQ-SF has shown good reliability and validity across 12 countries, and can predict health outcomes and behaviors related to physical activity.

The International Physical Activity Questionnaire (IPAQ):

One alternative measure to the IPAQ is the MRC PA questionnaire. It has the following characteristics:

Overview of the measure: The questionnaire is designed to find out about the physical activity of people in their everyday life for medical research. It has three sections: A) home activities, B) activity at work, and C) recreation.

Questionnaire Format: The questionnaire contains several elements, including

Getting up and going to bed times: The questionnaire asks for the average times of getting up and going to bed on weekdays and weekends in the past year.

Getting about and TV or video viewing: The questionnaire asks for the usual mode of transport for different distances, apart from going to work, and the hours of TV or video watching per day on weekdays and weekends in the past year.

Stair climbing and activities in and around the home: The questionnaire asks for the number of times of climbing up a flight of stairs or a ladder at home or at work, and the number of hours spent on various household tasks, such as cooking, cleaning, shopping, caring for children or elderly, and DIY.

Activity at work: The questionnaire asks for the types of work done in the last 12 months, the hours worked per week, the activity levels at work, the travel mode and distance to and from work, and the kneeling and squatting at work. This section can be skipped by people who have not worked in the last 12 months.

Recreation: The questionnaire asks for the frequency and duration of various recreational activities, such as swimming, walking, cycling, gardening, aerobics, dancing, sports, and musical instrument playing, in the last 12 months.

The occupational sitting and physical activity questionnaire (OSPAQ):

Overview of the measure: The OSPAQ is designed to measure the percentage of time spent in different occupational activities, such as sitting, standing, walking, and heavy labour. It can be used to examine the sitting and physical activity habits of different classifications of university employees, using an online survey based on the OSPAQ questionnaire.

Validation: has been validated (e.g. Maes et al 2020). It was also validated during the FEPA study, which included employees from the service and production sector. The participants completed the OSPAQ and wore two Axivity AX3 accelerometers for at least two working days. The self-reported and accelerometer-assessed measures were compared using intraclass and Spearman rho correlations. The sample consisted of 401 workers, mostly with physically active professions. The OSPAQ showed good validity for assessing occupational sitting and moderate validity for standing, while the validity for walking and heavy labour was weak. The validity scores were higher for sedentary professions than for physically active professions.

Conclusions and Limitations: The OSPAQ is a suitable instrument for measuring occupational sitting and standing in different types of professions, but not for walking and heavy labour. Accelerometer-based measures are recommended for these activities.

The General Physical Activity Questionnaire (GPAQ)

Overview of the measure: The GPAQ is a questionnaire developed by WHO to collect information on physical activity in three domains: work, transport, and recreation.

Questionnaire Format: The GPAQ is designed for face-to-face interviews by trained interviewers. It uses show cards to help respondents understand the types and intensity of physical activity in each domain. The GPAQ data can be analysed using continuous or

categorical indicators, such as MET-minutes per week or percentage of inactive population. The data are usually cleaned and checked for validity and consistency before analysis.

The Recent Physical Activity Questionnaire (RPAQ)

Overview of the measure: The survey aims assess physical activity in four domains: home, work, commuting, and leisure. The RPAQ was validated against DLW and showed a significant correlation and a low root mean square error.

Questionnaire Format: The RPAQ is self-administered by participants aged 16 and over. Summary variables for total physical activity are possible to calculate, but require technical expertise.

Validation: A validation study was completed that aimed to examine the validity of the Recent Physical Activity Questionnaire (RPAQ). The study used a combined heart rate and movement sensor as the criterion method and administered the RPAQ electronically to 1,923 adults from 10 European countries (Golubic et al 2020). The relative validity of the RPAQ was weak to moderate, with correlation coefficients ranging from 0.18 to 0.37 for PAEE and Moder to Vigorous Physical Activity (MVPA). The RPAQ also underestimated sedentary time in both sexes. Yet studies show that the RPAQ is a valid instrument for ranking individuals according to their physical activity energy expenditure, MVPA and sedentary time, and for comparing population estimates of these variables across European countries. The electronic RPAQ can be used with reasonable confidence in large-scale epidemiological studies and interventions.

Tools to Measure Work Performance (in relation to Physical activity and health)

Work performance can be measured using objective or subjective methods. Objective methods are methods that use quantifiable or observable indicators to measure work performance, such as productivity, absenteeism, presenteeism, or quality. Subjective methods are methods that use self-report or other-report to rate or evaluate work performance, such as job satisfaction, mental health, or performance appraisal. Some examples of validated questionnaires to assess work performance are:

The Workforce Sitting Questionnaire (WSQ):

Overview of the measure: This tool measures total and domain-specific sitting time based on work and non-workdays for working adults (Chau et al 2011).

Questionnaire Format: The questionnaire measures the time spent sitting, standing, and moving at work and during breaks, as well as the perceived barriers and facilitators of reducing sitting time at work. It has been validated in Australian and Canadian workers and can be used to evaluate workplace interventions to reduce sedentary behavior (Chau et al., 2012; Gilson et al., 2012).

Validation: The reliability and validity of the Workforce Sitting Questionnaire (WSQ) has been assessed. The validation study recruited 95 participants from two workplaces and by word-of-mouth in Sydney, Australia. They completed the WSQ and the International Physical Activity Questionnaire (IPAQ) twice, and wore an accelerometer for the 7 days between the two assessments. The test-retest reliability and criterion validity of the WSQ were determined using intra-class correlation coefficients (ICCs) and Spearman's correlations, respectively. The WSQ showed fair to excellent test-retest reliability for measuring total and domain-specific sitting time on work and non-workdays, with higher reliability for women than men. The WSQ also had sufficient criterion validity against accelerometers for measuring total sitting time and sitting at work on a workday, with higher validity for women than men. The WSQ and the IPAQ had moderate agreement for measuring average total sitting time per day.

Conclusions and limitations: The WSQ has acceptable measurement properties for assessing sitting time at work on a workday and for assessing total sitting time based on work and non-workdays. It would be suitable for use in research investigating the relationships between sitting time and health in working populations.

Health and Work Questionnaire (HWQ)

Overview of the measure: The Health and Work Questionnaire (HWQ) is a new multidimensional instrument for measuring workplace productivity and worker health (Shikiar 2004).

Questionnaire Format: The HWQ consists of 24 questions that form six sub-scales: productivity, concentration/focus, supervisor relations, impatience/irritability, work satisfaction, and non-work satisfaction. The sub-scales have high internal consistency reliability, except for impatience/irritability, which has adequate reliability.

Validation: The HWQ was tested among 294 volunteer reservation agents at a US-based international airline, who were divided into current smokers, former smokers, and non-smokers. The HWQ sub-scales correlated significantly with the objective measure of hours lost, indicating lower hours lost for higher HWQ scores. The sub-scales of work satisfaction

and supervisor relations also correlated significantly with the objective measure of total performance points, indicating higher performance for higher satisfaction.

Conclusion and limitations: The HWQ is a reliable and valid instrument for assessing the impact of health interventions on workplace productivity. However, it needs further validation in other work settings and populations, and its validity coefficients with objective measures are modest.

The Worksite Health Promotion Capacity Instrument (WHPCI):

Overview of the measure: This is a questionnaire that measures the organizational capacity to implement and sustain worksite health promotion programmes (Jung 2010), including physical activity programmes. It has been validated in Dutch and Finnish workplaces and can be used to identify the strengths and weaknesses of the organizational environment for health promotion.

Questionnaire Format: The instrument has been validated and has several subscales. The Worksite Health Promotion Capacity Instrument (WHPCI) is a tool to assess two factors for effective worksite health promotion: health promotion willingness and health promotion management. Both are based on one-dimensional constructs with high reliability. The Health Promotion Willingness scale measures the collective willingness of a company to implement WHP, while the Health Promotion Management scale measures the extent to which WHP is implemented systematically. Validators developed and tested the psychometric properties of the WHPCI using data from a sample of managers from German ICT companies. The Health Promotion Management subscale consists of five items that evaluate the degree to which the company follows a systematic and comprehensive approach to health promotion.

Validation: Initially, two items from the Health Promotion Willingness subscale were excluded as a result of an exploratory factor analysis and a reliability analysis, respectively. The remaining items showed acceptable internal consistency and construct validity. Previous authors have used ROC analyses to identify cut-off scores for each subscale that can differentiate between companies with and without health promotion willingness and management. Based on these scores, companies can be categorized into four levels of health promotion capacity: A (high), B and C (moderate), and D (low). The cut-off scores showed good sensitivity, specificity, predictive power, and efficiency.

Conclusion and limitations: The WHPCI can be used to diagnose, describe, explain, and evaluate the current level of health promotion willingness and management in companies, and to provide tailored support for improving their health promotion capacity. The WHPCI can also be used to collect comparable data from other industries, locations, or countries, and to examine the effects of WHP on health, social, and economic outcomes.

The Work Productivity and Activity Impairment Questionnaire (WPAI):

Overview of the measure: This is a questionnaire that measures the impact of health problems on work productivity and activity, including absenteeism and presenteeism. It has been validated in various populations and diseases and can be used to evaluate the economic burden of health problems (Reilly 2008).

The Job Satisfaction Survey (JSS):

Overview of the measure: The JSS is a questionnaire that measures the satisfaction or dissatisfaction with various aspects of one's job, such as pay, promotion, supervision, co-workers, work conditions, and overall satisfaction (Saane et al 2003).

Questionnaire Format: The survey aims to measure how employees feel about various aspects of their work, such as pay, promotion, supervision, benefits, recognition, and communication. The survey consists of 36 questions that ask the respondents to rate their agreement or disagreement on a six-point scale. The survey can be scored by adding up the responses to the questions for each dimension, and dividing by the number of questions. The higher the score, the higher the satisfaction. The scores can be compared to normative data from various samples and occupations to assess the level of satisfaction.

Validation: The questionnaire has been validated in various occupations and settings and can be used to evaluate the impact of job characteristics on employee well-being (Saane et al 2003)).

The General Health Questionnaire (GHQ):

Overview of the measure: This is a questionnaire that measures the psychological and emotional well-being of individuals, including aspects such as happiness, anxiety, depression, and stress. It has been validated in various populations and cultures and can be used to screen for mental health problems or evaluate the effectiveness of interventions (Jackson 2007).

Questionnaire Format: The General Health Questionnaire (GHQ) is a screening tool to detect common mental health problems, such as depression, anxiety, somatic symptoms and social withdrawal. It has been translated into 38 languages and has different versions with 12, 28, 30 or 60 items.

The GHQ28 is the most widely used version of the GHQ, as it is shorter and allows for more valid comparisons with other working populations. It has four sub-scales that measure psychological well-being, and uses a four-point response scale for each item. The total score ranges from 0 to 84, and any score above 4 indicates psychiatric caseness.

Validation: The GHQ has been shown to have high reliability coefficients, ranging from 0.78 to 0.95 in various studies. It is also a valid measure of mental well-being, as it correlates highly with other indicators of distress or psychological problems, such as sickness absence, poor productivity or increased turnover.

Conclusion and limitations: The GHQ is simple to administer, easy to complete and score, and widely used in many studies of occupational well-being. It can be scored in different ways, which provides multiple outcome measures. However, the GHQ is not usually used for predictive purposes, as it only indicates the probability of having a psychiatric disorder. It is also not suitable for paragraph summary, as it is out of scope.

Measurement Tools Summary:

The focus of measurements in the workplace has been predominantly on physical activity levels rather than sedentary behavior. Most measures of both physical activity and sedentary behavior at work rely on subjective techniques.

Evidence from studies using criterion standards suggests that being physically active during work duties increases total energy expenditure. Simple devices, like stepping devices, with low relative costs, can facilitate increased caloric expenditure without distracting from work – yet they are not always practicable, and their usage can be reliant upon external expertise to ensure data analysis.

Criterion standards, while providing certainty and specific information, have limitations, including feasibility issues in large samples and potential disruptions to work productivity. Objective measures, such as motion sensors (pedometers and accelerometers), are suitable for real-world settings, providing reliable, objective data without interfering with work productivity.

Subjective measures, such as surveys, have been common in studying behaviors in large populations, establishing associations with health benefits. However, they may yield potentially inaccurate information influenced by various factors, leading to underestimation or overestimation of variables.

Finally, reviews highlight the importance of measuring both physical activity and sedentary behaviors in the workplace to understand their associations, monitor trends, and evaluate interventions. Currently, self-reports dominate workplace data, and more information from large studies using objective measures is needed from a scientific perspective.

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