



Challenges and Barriers for Employees in Conducting Physical Fitness Measurements: A Literature Review

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ABSTRACT: Physical fitness measurement is one of the central government's programs that must be implemented by employees in government institutions such as community health canter in order to increase productivity at work by maintaining a fit body condition and improving the health status of employees. The measurement of physical fitness has various challenges and obstacles, both for health canter employees and those working in other public service places. This study aims to identify the challenges and barriers faced by employees in conducting physical fitness measurements. The research method used a literature review, selecting articles using the Google Scholar, PubMed, and Science Direct databases with inclusion criteria including articles in the form of studies with qualitative or quantitative approaches, in Indonesian or English, full-text, and published in the period from 2016 to 2024. A total of 50 articles were obtained, of which 10 articles were included in the discussion. The research results show that the barriers to measuring physical fitness include physical and social environmental barriers in efforts to improve employees' fitness and physical stamina; work efficiency and productivity; the need for improved facilities and infrastructure to support employees in physical fitness activities; challenges in measuring physical fitness, including the target distance for the Rockport fitness measurement method at 1.6 km, the high workload of employees which necessitates enhancing their fitness measurement capabilities, employees' understanding and knowledge, as well as instructions or commands from their superiors to improve the quality of physical fitness measurement results optimally.

KEYWORDS: Challenges, Barriers, Physical fitness measurement, Physical activity, Employees.

INTRODUCTION

Non-communicable diseases are non-infectious diseases that are very difficult to cure once they become chronic. Therefore, the best effort that can be made is to control the risk factors for the occurrence of these non-communicable diseases. According to the WHO, lack of physical activity is one of the ten main risk factors for death. The implementation of fitness measurements is used as a preventive effort against non-communicable diseases (Ervina et al., 2020). The Ministry of Health has conducted physical fitness measurements using the 1.6 KM Rockport field test due to its ease, low cost, and ability to be conducted on a large scale and more efficiently. The Rockport test is valid against the Bruce test, which is the gold standard for measuring cardiorespiratory fitness (Budiman, 2017). Therefore, the Rockport test is suitable for use both in the Ministry of Health and in the community. Additionally, measuring physical fitness through the Rockport Test method is a reliable way to estimate VO₂ max among the population in Indonesia. This aligns with research on physical fitness measurement in India, where fitness assessment participants ranged from young adults to those over 50 years old. It could potentially be used as an indirect method to assess aerobic fitness on a large scale. there is Comparison of the Rockport 1 Mile Walk Test Based on Treadmill and Track Based to Estimate Aerobic Capacity (Chaturvedi et al., 2018).

In the study by Setiyorini & Tatiani (2020), observations indicated that by exercising, they felt a difference in their bodies, specifically being fitter than before. They hope that with their routine of exercising at the fitness center, the gout and shortness of breath they are currently experiencing can be cured soon. This illustrates that a person will take health actions when they feel threatened by a certain disease (Berhimpong, 2020). By believing in the benefits of exercising, a person will be more enthusiastic about adopting a healthy lifestyle. The results of the research by Setiyorini & Tatiani (2020) support this study, indicating that the more individuals perceive the benefits, the more likely they are to engage in the intended health or preventive behaviours. Anjali



and Sabharwal (2018) in their study found that the benefits of physical activity have been well documented, leaving no doubt about its significance for personal and social health. In terms of challenges in physical measurement, lack of time, management support, inadequate facilities, workload balance, and culture are often reported as common barriers to physical activity (PA) participation in the workplace. In comparison, identifying facilitators of PA in the workplace is rare. The 'one size fits all' approach to overcoming barriers may also not be effective in a university environment where a multidisciplinary workforce exists due to the heterogeneous nature of job roles (Safi et al, 2023).

Looking at the development of physical fitness measurement with the Rockport method, which is a reliable method for estimating VO₂Max in adults. The Rockport method fitness measurement is conducted so that it can be used to assess aerobic fitness on a large scale, based on population studies. (Henny AP and Dien A, 2023). However, this also indicates that barriers and facilitators are most often classified under the domains of 'Beliefs about Consequences' and 'Context & Environmental Resources'. The most common barriers to promoting PA are the belief that clients cannot overcome the barriers to engaging in PA, and the lack of training on how to promote PA to individuals with mental health issues (Glowacki et al., 2019). An example in other physical measurements is that research has shown that sub-maximal tests, and even non-exercise tests, can be used as relatively accurate methods to predict VO₂max and VT, at least in healthy and less active individuals. The overall results of the current experimental research studies suggest that submaximal tests, and even non-sport tests, can be used as relatively accurate methods (Alajmi et al., 2020). The research used a systematic review of thirty-five included papers. Of the total, 46% were conducted in North America, and the majority had more female participants (86% in mixed-gender studies, 26% only female). Similar themes emerge at all three levels as facilitators and barriers. At the individual level, attitudes, concern for health, and physical changes. At the environmental level, social support, social accountability, aspects of society that can change and those that cannot. Lastly, the delivery, design, and content at the intervention level. Additional facilitators at the intervention level include encouraging self-regulation through the Behaviour Change Taxonomy (Deslippe et al., 2023). In the context of Ministry of Health employees, the study on physical fitness measurement among overweight Ministry of Health employees reached 56 individuals or 46.7%, lower compared to the government employee group in the 2018 National Basic Health Research results, which was 53.7%, but still higher than the general population group (35.4%). Most (54.2%) of the Ministry of Health employees are at a fit level. The largest proportion of fitness levels is found in the age group of 40-49 years at 73% (Apriyanto and Nurwahyuni, 2021).

The increase in physical fitness measurements is largely explained in a qualitative study conducted using a grounded theory approach. A total of 30 in-depth interviews and 8 focus group discussions were conducted among doctors and nurses, respectively. The audio-recorded data were transcribed, coded, and thematically analysed (George et al, 2021). The main themes identified are motivators, barriers, and future considerations for physical activity. The factors that motivate doctors are the fear of non-communicable diseases and the desire to stay fit, while nurses are more concerned with their body image. Common barriers include gender, lack of time, laziness, bad weather, and safety issues. Excessive reliance on medication and prioritizing their patients' health over their own is an additional barrier (George et al, 2021).

Barriers and potential facilitators of physical activity (PA) from the perspective of university employees, as shown, individuals in management positions do not take time for lunch, and the lack of management support is stated as one of the main barriers between job roles and gender that prevents staff from engaging in PA. This indicates unhealthy behaviour led by senior management, which also reflects an unhealthy workplace culture at the participating universities in this study. An unhealthy culture can negatively impact employee PA behaviour, retention, productivity, absenteeism due to illness, job satisfaction, and long-term health and well-being.

To facilitate PA engagement, a comprehensive approach is needed to accommodate PA in the workplace for various job roles and genders, starting from senior management. The results of this study indicate that future research should focus on comprehensive interventions to promote a workplace culture of active lifestyles. Future research should also focus on providing educational, motivational, and informative interventions regarding the importance of engaging in physical activity, its impact on health and well-being, and alternative ways to engage in physical activity while working. Having access to on-site fitness centers, various activity classes such as walking, and sports-related competitions will be beneficial and can serve as facilitators and contribute to employees' PA behaviour. Additionally, management support and having flexibility in the workplace are considered major barriers, and having protected time of 15-20 minutes for PA engagement can help employees engage in active behaviour at work (Safi et al, 2023).



This study aims to identify generalizable and specific barriers and facilitators from university staff perceptions of PA engagement in the workplace. These findings contribute to the sparse literature on evaluating workplace barriers and facilitators using the literature review method.

METHODS

The research method in this article is using a literature review, with the following stages: determination of the writing topic, determination of the scope, exploration of articles, and selection of articles using the Google Scholar, PubMed, and Science Direct databases with inclusion criteria including articles in the form of studies using qualitative or quantitative approaches, in Indonesian or English, full-text, and published in the period from 2016 to 2024. The keywords used in the article search were "physical fitness measurement," "challenges of physical fitness measurement," and "barriers to physical fitness measurement." Based on the search results, 50 articles were obtained, of which 10 articles were included in the discussion. The inclusion criteria were materials that matched the keywords, and the exclusion criteria were journals that were review articles.

RESULTS

The results of optimal physical fitness measurements encounter many challenges and obstacles felt by employees who work regularly. This is based on a literature review of 10 articles obtained through a search using the keywords physical fitness measurement, challenges and obstacles of physical fitness measurement. The results show that several articles mention that the challenges and obstacles of physical fitness measurement can be viewed from various aspects comprehensively. This also supports the practice of physical fitness in the workplace. Measuring physical fitness has challenges such as time constraints, participant laziness, and the distance of the Rockport track. In addition, there are various obstacles in physical fitness measurements. The complete results of the literature review can be seen in Table 1.

Table 1. Article Synthesis Results

No	Title	Author	Objective	Methods	Results
1	Designing (E-Bugar) an information system for physical fitness measurement at the Ministry of Health of the Republic of Indonesia	(Ervina et al,2020)	Conducting qualitative studies with ministry of health employees, including administrative staff, ministry of health employees, health service units, the director general of public health, and the director of occupational health and sports.	In-depth interview method, observation, and literature review	To produce a prototype (E-Bugar) of an information system for physical fitness that includes filling out the physical activity readiness questionnaire (PAR-Q), followed by physical examinations of height, weight, blood pressure, blood sugar, and cholesterol levels, this physical fitness assessment is conducted using the Rockport method.
2	Treadmill comparison based and Rockport Walk test 1 mile for estimating aerobic capacity in adults age 30-50 years in India	(Chaturvedi, et al., 2018)	To compare physical fitness measurements with a 1-mile distance and to enhance understanding of the health conditions and capabilities of patients in India in determining the maximum physical measurement capacity in healthy adults aged 30-50 years	Experimental research design with subjects of 40 working adults (20 men and 20 women)	The Rockport test is a reliable method for estimating VO2 max in the Indian population and can be used as an indirect method to assess aerobic fitness on a large scale. comparison of the Rockport 1 mile walk test based on treadmill and track to estimate aerobic capacity



3	Analysis of physical activity implementation based on the health belief model by health workers at the community health center	Berhimpong et al (2020)	The implementation of physical activity based on the health belief model by healthcare workers at <i>Puskesmas</i> Bahu Manado has been well executed. Healthcare workers believe in the dangers of a disease and are convinced that engaging in physical activity has many benefits, one of which is reducing the risk of disease.	This research was conducted using qualitative methods at <i>Puskesmas</i> Bahu Manado from July to August 2020, using purposive sampling techniques.	The results of in-depth interviews and document observations based on the health belief model show that healthcare workers believe that people will be motivated to take actions that will improve their health because they are aware of the risks of diseases that negatively affect their health.
4	Overview of employee fitness measurement using the Rockport method: systematic review	(Heny,AP & Dien A, 2023)	Observing the development of the Rockport fitness measurement method, which is a reliable method for estimating VO2Max in adults. The Rockport fitness measurement is conducted so that it can be used to assess aerobic fitness on a large scale, based on population studies.	This research uses the systematic review method with PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis).	The research results were obtained through a systematic search that yielded six articles. The studies were highly varied in study design, perspective, and fitness measurement, with the Rockport method being more optimal for measuring young individuals in a healthy physical condition.
5	Barriers and facilitators to physical fitness assessment in primary health care workers: a systematic review	Glowacki, et al (2019)	The purpose of this review is to identify and theoretically analyse the barriers and facilitators for healthcare providers in promoting physical activity (PA) to individuals with mental health.	Observational design with quantitative and qualitative analysis	Thirty-three studies were included (15 quantitative, 12 qualitative, 6 mixed methods), with a total of 231 factors extracted and coded into the TDF domain. Barriers and facilitators were most frequently classified under the domains of 'Beliefs about Consequences' and 'Environmental Context and Resources'. The most common barriers to promoting PA are the belief that clients cannot overcome the barriers to PA engagement, and the lack of training on how to promote PA to individuals with mental health issues.



6	Estimating exercise capacity by comparison of non-maximal tests	Alajmi et al., (2020)	Research to show that sub-maximal tests, and even non-exercise tests, can be used as relatively accurate methods to predict VO ₂ max and VT, at least in healthy and less active individuals	Experimental Research	The overall results of the current study suggest: that submaximal tests, and even non-sport tests, can be used as relatively
7	The relationship between body mass index (BMI) with the physical fitness level of ministry of health employees	Apriyanto and Nurwahyuni (2021)	The purpose of this research is to analyse the relationship between body mass index and the physical fitness level of employees at the Indonesian Ministry of Health.	This research is a quantitative study with a cross-sectional approach.	The overweight employees of the Ministry of Health reached 56 people or 46.7%, lower compared to the government employee group in the 2018 Basic Health Research, which was 53.7%, but still higher than the general group (35.4%). Most (54.2%) of the Ministry of Health employees are at a fit level. The largest proportion of fitness levels is found in the age group of 40-49 years (73%).
8	Barriers and facilitators to adherence to diet, physical activity, and lifestyle behaviour interventions: a qualitative systematic literature review	Deslippe et al (2023)	Lifestyle interventions that foster self-regulation skills, opportunities for social engagement, and goal personalization can enhance behavioural adherence. This can be achieved through the inclusion of BCT, reduction of intervention support, identification of meaningful goals, and barriers.	This review follows the preferred reporting items for systematic reviews and meta-analyses guidelines.	Thirty-five papers were included. Of that number, 46% were conducted in North America and the majority had more female participants (86% in mixed-gender studies, 26% only female).
9	Motivators and barriers to physical activity among healthcare professionals: a qualitative study	George et al (2021)	The goal is to identify motivators and barriers to physical activity among doctors and nurses involved in the public and private healthcare sectors in Ernakulam district.	Qualitative study was conducted using a grounded theory approach. A total of 30 in-depth interviews and 8 focus group discussions were conducted among doctors and nurses, respectively.	The main themes identified are motivators, barriers, and future considerations for physical activity. The factors that motivate doctors are the fear of non-communicable diseases and the desire to stay fit, while nurses are more concerned with their body image. Common barriers include gender, lack of time, laziness, bad weather, and safety issues. Excessive reliance on medication and prioritizing their patients'



<p>10 Workplace physical activity barriers and facilitators: a qualitative study based on employee's physical activity (PA) levels</p>	<p>Safi et al, (2022)</p>	<p>Contribute to the limited literature in terms of evaluating the barriers and facilitators for university employees to encourage engagement with PA in the workplace. These findings can be applied to develop interventions related to PA, health, and well-being that specifically target these identified barriers experienced in the workplace and thus potentially reduce absenteeism and increase productivity.</p>	<p>Audio-recorded data were transcribed, coded, and thematically analysed. Forty-one employees (female = 17; male = 24) participated in a focus group to discuss the barriers and facilitators they perceive for PA in the workplace.</p>	<p>health over their own is an additional barrier. More than 75% of participants reported a lack of management support as one of the perceived barriers to their PA engagement at work. About 58% also reported workplace culture as a barrier to PA participation. Open access to fitness centers on campus is considered a key facilitator for engaging in PA in the future. Similarly, increased management support for engaging in PA and having flexibility during the workday is considered a facilitator for PA engagement and a way to reduce sedentary behaviour in the workplace.</p>
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DISCUSSION

In Law No. 36 of 2009 on Health Article 80 states that sports health efforts are aimed at improving the health and physical fitness of the community. The improvement of the degree of health and physical fitness of the community is a fundamental effort in enhancing academic, work, and sports achievements. Sports health efforts are carried out through physical activities, physical training, and/or sports. The implementation of physical activity based on the health belief model by healthcare workers at the community health center has been well executed. Healthcare workers believe in the dangers of a disease and are convinced that engaging in physical activity has many benefits, one of which is reducing the risk of disease. Time is a barrier to engaging in physical activity (Safi et al., 2020). Additionally, data shows that physical fitness is very important for improving an individual's work productivity (Heny AP and Dien Anshari, 2023).

Measuring physical fitness enhances the accuracy of the information available for direct assessment of VO2 max, which requires maximal or near-maximal effort from the subjects, often difficult to achieve in individuals with low cardiorespiratory fitness, especially in middle-aged and older populations. The need for direct supervision by a doctor when evaluating older individuals or those known to have cardiovascular diseases or related risk factors adds to the challenge of conducting maximal exercise tests to assess VO2. (Chaturvedi, 2018).

Submaximal tests such as step tests, walking tests, and/or running tests are useful for measuring VO2max in individuals. In a systematic review of the challenges and barriers to physical fitness measurement, it was found that physical activity is related to the level of physical fitness; the better a person's physical activity, the better their level of physical fitness (De Oliveira et al., 2018). A concrete example can be seen from the study conducted by Berhimpong (2020), which shows that the implementation of physical activity based on the health belief model by healthcare workers at Bahu Manado community health center has been well executed. Healthcare workers believe in the dangers of a disease and believe that by engaging in physical activity, there are many benefits, one of which is to reduce the risk of disease (Berhimpong, 2020).

Measuring physical fitness also supports collaboration among healthcare professionals. With collaboration, contributions to health efforts and their obstacles can be minimized, and disseminating information becomes easier. This is found in research with



a study aimed at contributing to the limited literature in evaluating the barriers and facilitators for university employees to encourage engagement with physical activity (PA) in the workplace. These findings can be applied to develop interventions related to PA, health, and well-being that specifically target these identified barriers experienced in the workplace and thus potentially reduce absenteeism and increase productivity. In their study on the implementation of minimizing barriers and improving outcomes in increasing employee engagement in physical activities (Safi et al., 2022).

One of the factors physical activities among doctors and nurses is greatly hindered by various internal and external factors. Behavioural and environmental changes that are more supportive are needed to increase physical activity in this group. If healthcare professionals themselves are less active, this can negatively impact their effectiveness in motivating patients to live healthily. According to George et al. (2021), the use of RME in clinical practice allows doctors to conduct clinical research more efficiently. Workplace-based interventions and behavioural changes are needed to overcome these barriers, such as providing sports facilities at the workplace, internal health promotions, and more flexible scheduling so that healthcare workers can more easily engage in regular physical activity (George et al., 2021).

The measurement of physical fitness is closely related to the increase in a person's physical activity, contributing to the reduction of Non-Communicable Diseases. A study found that adherence to diet, physical activity, and lifestyle behaviour interventions is greatly influenced by a combination of personal, social, and systemic factors. A holistic approach that focuses on social support and the personalization of interventions is key to successfully improving adherence and long-term health outcomes. If implemented, this will have a positive impact on the reduction of diseases that require long-term commitment, such as the increasing prevalence of non-communicable diseases (Deslippe et al., 2023).

Body mass index (BMI) is not related to the physical fitness level of employees. A study was conducted on employees of the Ministry of Health of the Republic of Indonesia, and the research results showed that the majority of employees were in the fit category (54.2%), with the highest proportion in the age group of 40-49 years (73%). The overweight BMI status reached 46.7%, lower than the general data of government employees based on Indonesian Basic Health Research. However, after controlling for factors such as race, smoking status, health status, physical activity, age, and gender, the Chi Square analysis yielded a p-value of 0.159, which means there is no significant relationship between BMI status and physical fitness levels among employees of the Indonesian Ministry of Health (Apriyanto and Nurwahyuni, 2021). The aerobic capacity test (VO₂max) conducted to measure physical fitness in government employees can be performed using maximal and sub-maximal methods. Maximal methods such as the Multistage Fitness Test (MFT), Balke Test, and Cooper Test are usually conducted until participants reach their maximum capacity, requiring a substantial budget allocation. In contrast, sub-maximal methods like the Queens College Step Test and Rockport Fitness Walking Test are performed at lower intensities and do not reach maximum effort, making them more budget-friendly and suitable for implementation according to the desired physical fitness measurement conditions and the workplace (Alajmi et al., 2020).

In addition, the measurement of physical fitness in the management of employee physical activities can be more effectively conducted using an application system, specifically an electronic application that can be accessed by all employees through the E-Bugar application. Ervina et al. (2020) noted that the use of the E-Bugar application facilitates the periodic measurement of the physical fitness of Indonesian Ministry of Health employees with the aim of increasing employee motivation to actively exercise and maintain fitness (Ervina et al., 2020). One of the challenges is encouraging all employees to actively participate in physical fitness measurements. This requires effective socialization and support from the leadership, including the provision of incentives or rewards to motivate employees to participate in the program. Leaders can easily share information with their colleagues, which allows physical fitness measurements to be conducted more quickly and efficiently. This is crucial for achieving optimal fitness results (Ervina et al., 2020). Another challenge faced in physical fitness measurement is the lack of adequate facilities and infrastructure. This is because fitness measurements require adequate facilities and infrastructure, such as safe and low-traffic tracks or suitable sports facilities. The procurement and management of these facilities pose a unique challenge, especially when they need to cover many locations. This is due to uneven internet connectivity and human resources that are not yet fully skilled in managing and operating information systems, which hinders the implementation of mobile or online-based electronic systems like the E-Bugar application (Ervina et al., 2020).

Barriers to measuring physical fitness are also related to employees' mental health and affect the elderly as well. A qualitative study by George et al. (2021) examined the factors that motivate and hinder physical activity among healthcare



professionals, specifically doctors and nurses in the Ernakulam district, Kerala, India. This research was conducted through 30 in-depth interviews and 8 focus group discussions, using a grounded theory approach for data analysis. This study highlights the need for interventions that consider the specific challenges faced by healthcare professionals, particularly in terms of time, motivation, and environmental support, to enhance their participation in physical activities (George et al., 2021). The exchange of cross-border health information can also help in addressing infectious diseases and other global health issues. By sharing data and experiences, countries can learn from each other and develop more effective strategies to improve the health of their populations (Shah & Khan, 2020).

The main themes identified are motivators, barriers, and future considerations for physical activity. The factors that motivate doctors are the fear of non-communicable diseases and the desire to stay fit, while nurses are more concerned with their body image. Common barriers include gender, lack of time, laziness, bad weather, and safety issues. Excessive reliance on medication and prioritizing their patients' health over their own is an additional barrier. Physical activity among doctors and nurses is severely disrupted. Providing a favourable environment and behavioural changes are necessary to combat the silent epidemic of physical inactivity (George et al., 2021).

CONCLUSION

The conclusion of this research includes that measuring physical fitness has challenges and obstacles related to employees' physical activities in various aspects of life to reduce long-term diseases and enable better data analysis. Physical fitness measurements can be conducted more effectively. By utilizing technology such as the E-Bugar application, which can be accessed by all employees with an online network, but may be hindered by internet connectivity and availability, it is important for all parties to collaborate in implementing physical fitness measurements effectively and efficiently in the workplace to improve the quality of health services and reduce barriers from both physical and social environments related to low levels of physical fitness participation and physical activity in daily life.

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