



Review Article

# Physical Activity Vital Sign, the Need for Incorporation into the Clinical Practice: Narrative Review

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## Abstract

**Background:** Physical Inactivity (PI) is considered one of the main risk factors for widespread of Non-Communicable Diseases (NCDs). Although of the high prevalence of PI, the screening for it is still underused. Screening the Physical Activity (PA) level is crucial to managing and prescript the suitable intervention. This review explores the importance of Physical Activity Vital Sign (PAVS) as a screening tool and the available supportive evidence that PAVS changes the practice of physicians and inactive patients. **Methodology:** Narrative review was done by using an academic database search. Thirty-one English online articles about the physical activity vital signs among adults have been included in this review. **Findings:** Using PAVS upon the nursing assessment prior to the physician consultation in many countries as a primary screening tool for PA level. There is supportive evidence that the physicians' practice toward PI and the patients' behavior is positively modified. **Conclusion:** using PAVS is essential for changing the clients' PA level and stimulating the physicians toward more incorporation of the PA as part of the management plan.

**Abbreviations:** ACSM: American College of Sport's Medicine; BMI: Body Mass Index; EIM: Exercise is Medicine; NCDs: Non-Communicable Diseases; NNT: Number Needed to Treat; PA: Physical Activity; PAVS: Physical Activity Vital Sign; PE: Physical Exercise; PI: Physical Inactivity

**Keywords:** Physical activity; Physical activity vital sign; Physical exercise; Physical inactivity

## Introduction

Physical Inactivity (PI) is pandemic globally and linked significantly to a wide spectrum of (NCD) as well as a major cause for prematurity death [1]. During (2008), Physical Activity Guidelines Advisory Committee reported that physical inactivity caused (6%-10%) of the cases of premature mortality, coronary heart disease, type 2 diabetes, breast cancer and colon cancer globally [2]. Furthermore, the accumulative evidence supports

the impact of physical inactivity is not only on NCDs occurrence but its negative effect on the community's health, economy, and development [3-5]. On the contrary, the salutary impact of PA on all-cause mortality, morbidity, life span, overall quality of life, and prevention of many NCDs is well established in the literature [6-8].

Physical activity had been championed as an essential intervention for management, reversing many NCDs and preventing premature death. Despite the recognized effect of physical inactivity as a major contributor for NCDs and the health & economic benefit of PA, still, the PA is not assessed or screened prior to the physician consultation at all health care levels in many countries, unlike the other prevalent risk factors such as high Body Mass Index (BMI) and hypertension. Calls from the World Health Organization, American Heart Association, American College of Sport's Medicine (ACSM), and Exercise is Medicine (EIM) insist on including PA as part of routine screening in all the health care

systems. Additionally, they encourage healthcare providers in all settings to frequently assess and advise clients on PA to decrease physical inactivity [9-12].

### **Aim and Objective**

This narrative review tries to explore the available evidence in the literature about the PAVS, its implementation benefits, and disadvantages. Also, this article assesses the available knowledge about the role of PAVS on improving the overall community health.

### **Methodology**

This is a narrative review study to determine the importance of PAVS. The searching was through using the following searching engine; google scholar, PubMed, Cochrane library, and TRIP database. We also searched Medline, Embase, CINAHL, AMED, HMIC (Health Management Information Consortium), Cochrane Database of Systematic Reviews Cochrane Controlled Clinical Trials (CENTRAL), DARE (Database of Reviews of Effectiveness), NHS EED (Economic Evaluations Database), and Web of Science from inception to October 2021. The following keywords were used; “Physical Activity Vital Signs”, “effect,” “impact,” “influence,” “physical exercise,” physical exercise training,” “physical activity” and “screening.” A total of (31) English online published articles were identified and assessed accordingly with no date limit for publication time.

### **Epidemiology**

#### **Definitions**

Physical inactivity definition is still an area for argument and research as it is confused with sedentary behavior [13]. Some authors agreed to define the sedentary any waking behavior with energy expenditure of  $\leq 1.5$  Metabolic Equivalents while in a sitting, reclining or lying posture [14,15].

Physical Exercise (PE) is usually misused with physical activity. Physical activity is a very general term that describes any movement that utilizes energy more than resting energy. Physical activity is not repetitive or structured program and has nothing to do with individual physical skills. While PE is defined as repeated structured movements of muscle or group of muscles to reach health-related and or skilled related benefits [8].

The health-related benefits are improved body composition (e.g., muscle mass, fat mass, weight, and waist circumference), cardiopulmonary fitness (e.g., reduction in resting heart rate, increase in VO2 max, and improvement in lung volumes), muscle strength, and flexibility. The skills-related benefits are balance, agility, coordination, reaction time, power, and speed [16].

Generally, PE can be of two kinds aerobic and resistance exercises. The former is those exercises that raise the heart rate and energy expenditure. While resistance exercise is moving a group of muscles against weight, which could be body or object weight [16]. The best examples of aerobic exercises are cycling, swimming, and running. The best example of resistance exercises are dumbbells lifting and pushups [17,18].

The benefit of PE is not restricted to weight management only but can extend the positive effect to different body physiological and metabolic systems from both preventive and therapeutic perspectives. There is evidence that suggest the effect of regular PE on preventing the conversion or reversing the prediabetes to full-blown disease of diabetes mellites type II [19]. This was also reported for prehypertension, and borderline lipid profile as well as prevention from the common cancers [20-22].

Many studies suggested the effect of the regular PE on controlling the chronic disease and slowing down the progression toward the complications. The common example is control of diabetes mellitus II as reported by Yang, Dan et al. [23] and the control on the subsequent complications of diabetes mellitus II [24,25].

Furthermore, PE is identified as effective intervention to reduce the probability of cardiovascular diseases which are the leading cause of death worldwide [26]. Also, the effect extends to longevity and preventing premature death [27]. A wide spectrum of the role of PE involves many body systems including; mental, musculoskeletal, age-related disease, sleep, and others [8,28].

Physical Activity Vital Sign is a primary screening tool consisting of two questions to determine the weekly amount of PA practiced by the client. As recommended by ACSM and EIM, the following questions, which take (30) seconds, should be asked for every client once an assessment of other vital signs is done as in Table 1.

1. On average, how many days per week do you engage in moderate to vigorous physical activity?	days	<p><b>What is Moderate Intensity?</b></p> <ul style="list-style-type: none"> <li>You can talk, but not sing, while performing the activity.</li> <li>Examples: brisk walking, slow biking, doubles tennis, active home chores and gardening, etc.</li> </ul> <p><b>What is Vigorous Intensity?</b></p> <ul style="list-style-type: none"> <li>Vigorous intensity: You can no longer talk easily during the activity and are somewhat out of breath.</li> <li>Examples: jogging, fast bicycling, singles tennis, aerobic exercise class, swimming, etc.</li> </ul>
2. On average, how many minutes do you engage in physical activity at this level?	minutes	
PAVS = (multiply #1 by #2)	Minutes/week	
PAVS: Physical Activity Vital Signs		

**Table 1:** Physical Activity Vital Sign Questions.

Many international PA guidelines recommended the amount of PA for all ages of moderate and vigorous activities of the aerobic component as in Table 2.

Age Category	Recommended Physical Activity (minutes/week)	
	Moderate	Vigorous
Children 5 to 17 years	420	180
Adult 18 to 65 years	150	75
Elderly above 65 years	150	60

**Table 2:** The Recommended Physical Activity for (5 to above 65) years old individuals.

Physical activity vital sign is applicable for both males and females as well as for pediatric age group (5 to 17) years of old [29,30]. Determining the clients at different PA levels necessitates the treating physician's suitable intervention. The intervention could range from straightforward educational advice as brief intervention, and exercise prescription to referral to specialized services.

### Rationale and Benefits of Applying Physical Activity Vital Sign at the National Level

The rationale for incorporating PAVS into the electronic medical system at the national level is

- Physical inactivity is prevalent more than other NCDs-related risk factors. It is not being screened in all governmental health care facilities in many countries as part of routine vital signs assessment before physician consultation.
- Stratification of clients according to the PAVS will enable the physicians to conduct the suitable intervention to increase the client's PA level.
- Widening promotion for PA as preventive or part of NCDs management options cross all the health sectors. Subsequently,

a link between the clinical practice and the community for PA promotion can augment effectiveness and encourage more extended maintenance of the intervention.

- Availability of national live data about the population PA level, which could be captured from the electronic medical record for different community interventions.
- Moreover, PAVS data set of the current trends can be utilized as valid representative data for monitoring the effectiveness of any ongoing intervention research, quality improvement projects etc.
- Applying the PAVS as an essential sign cross, the health sectors will be in alignment with many international recommendations and supports many national goals.

### Evidence Supporting the Implementation of Physical Activity Vital Sign

- It is a validated tool and is used in many international health systems to screen and intervene accordingly [31].
- Counseling the clients about PA by physicians especially at primary health care level provides up to moderate effect on decreasing the physical inactivity and promote improvement in PA level [32,33].
- It was determined that the Number Needed to Treat (NNT) for one client with sedentary lifestyle to meet (150) minutes / week of PA to be (12) [34]. The NNT for managing sedentary client is close to that for smoking cessation, which is (14) [35].
- Applying PAVS is feasible and effective in improving clinical outcomes in routine clinical practice especially there is evidence based linear relationship between PA and health and longevity [36,37].
- Physical activity intervention and referral strategies are helpful to decrease healthcare use and costs. Furthermore, it is directly incorporating into the continuity of care [38-41].

## Discussion

Updating the classical vital signs due to new emerging diseases like sedentary lifestyle and physical inactivity is very sensible and logic especially the data indicated their high prevalence internationally. As many health systems shift toward more preventive approach on fighting NCDs the need of PA screening is very crucial. Nevertheless, community, health care workers as well as health care systems should be involved more to consider the PAVS as essential screening tool.

Using PAVS as screening tool within each nursing assessment should take care of the followings:

- Need for nursing staff training on how to plug the client's data about the PAVS.
- The need for training the treating physicians on exercise prescription and conduction of the proper intervention according to the PA level.
- Adapt the health electronic system to include the PAVS as part of the usual vital signs.
- Expansion of any services related to PA promotion.
- Regular monitoring of the live data to assess the effectiveness of the intervention.
- Dissemination of the data with the health care systems, research community and with the population.

## Conclusions

This narrative review concludes the need for incorporating the PAVS in the nursing assessment of any clients prior to physician consultation. There is major agreement on changing the behavior of the clients toward more active lifestyle as well the practice of physicians to more considering the sedentary lifestyle as part of the management plan of all clients regardless their primary medical conditions.

Although, corporation of PAVS is not costly and does not need sophisticated training or system adjustment but still there is a gap to assess the long-term effect of such screening on the NCDs burden. The balance between the needs of train staff and well-adapted medical electronic system should be highly considered. Sharing the data and progression for further improvement with related stockholders and the community is vital.

## Conflict of Interest

Authors have no financial interest, arrangement or affiliation with anyone in relation to this research that could be perceived as a real or apparent conflict of interest in the context of the subject of this study.

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