The Effect of the Research & GAP Playlist on Physical Activity Levels Among Productive-Age Workers: A Pre-Experimental Study

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Abstract. Physical inactivity is a growing concern among productive-age workers, especially those in sedentary occupations such as creative office settings. Music has been increasingly recognized for its ability to influence mood, motivation, and physical performance. This study aimed to examine the effect of a curated music playlist, *"Research & GAP"*, on physical activity levels among young workers. A pre-experimental one-group pretest-posttest design was employed. The study involved 30 staff workers aged 18–35 years in Jonggol Village, Bogor Regency. Participants listened to the *Research & GAP* playlist—comprising mid-fast tempo songs in G chord progression—daily for one month. Physical activity was measured before and after the intervention using the Global Physical Activity Questionnaire (GPAQ), and data were analyzed using the Wilcoxon Signed-Rank Test. Pre-intervention data showed that 56.7% of participants had low physical activity levels, while 43.3% had moderate levels. Post-intervention, 86.7% of participants moved into the moderate activity category, with a statistically significant increase in GPAQ scores (mean pre-test = 722.33 METs; mean post-test = 1305.20 METs; p = 0.000). The findings suggest a substantial improvement in physical activity following the music intervention. Listening to a curated music playlist significantly increased physical activity levels among productive-age office workers. This study supports the use of music as a low-cost, accessible intervention to promote physical activity and well-being in sedentary work environments. Further research with control groups and longer durations is recommended to validate these findings.

Keywords: physical activity, music, productive age, solfeggio frequency, occupational health.

1 Introduction

According to the 2020 Indonesian Population Census, 69.28% of the population falls within the productive age group of 15–64 years. This demographic bonus presents a

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significant opportunity for national development due to the abundance of a potentially productive workforce [1]. However, it also poses a public health challenge, as this same age group shows a rising prevalence of non-communicable diseases (NCDs) such as coronary heart disease, diabetes mellitus, depression, and stress. These health issues are closely associated with unhealthy lifestyles and low levels of physical activity [2].

Evidence from previous studies indicates a strong link between insufficient physical activity and increased risk of chronic disease [3]. For instance, individuals with low levels of physical activity are reported to have a 4.4 times higher risk of developing coronary heart disease and are also more susceptible to diabetes mellitus [4]. According to the Indonesian Ministry of Health (2021), physical activity includes any bodily movement generated by skeletal muscles that results in energy expenditure, encompassing activities at school, work, home, travel, and leisure. These activities are crucial for maintaining physical and mental health and enhancing overall quality of life. Despite this, the 2018 national health survey (Riskesdas) found that 33.5% of Indonesians do not meet the recommended levels of physical activity [2]. The World Health Organization (WHO) categorizes physical activity into three types: light (e.g., washing dishes, sweeping), moderate (e.g., cycling, gardening), and vigorous (e.g., jogging, futsal), with corresponding weekly duration thresholds for optimal health benefits. Factors such as age and gender also influence physical activity levels [5].

Parallel to this, emerging research highlights the psychological and physiological effects of music. Goltz and Sadakata demonstrated that listening to music during cognitive tasks such as reading, writing, and memorizing enhanced performance, with 95% of respondents reporting a positive emotional impact [2]. The brain's auditory processing involves pathways from the thalamus to the primary auditory cortex, with tonal information organized spatially through a system known as tonotopy. Music not only activates pleasure centers but can also mitigate negative emotions, suggesting a potential role in enhancing motivation and engagement in physical activities [6].

Solfeggio frequencies, widely studied in psychoacoustics, are believed to affect emotional states. Frequencies such as 396 Hz (eliminating negative thoughts), 417 Hz (facilitating change), and 528 Hz (promoting transformation) have been theorized to support emotional and mental well-being [7]. However, public perception of music in health contexts, especially in Indonesia, remains limited, and in some communities, music is still viewed as irrelevant or even detrimental to health.

To explore this further, the author developed the "Research & Gap" playlist, curated from various digital streaming platforms. The playlist comprises songs with G chord progressions, tempos ranging from 90–178 BPM, and musical dynamics such as forte and crescendo—elements chosen for their potential to stimulate movement and positive emotions. Given the existing literature on music's influence on mood and activity, and the widespread issue of physical inactivity among the productive population, this study seeks to investigate the impact of the "Research & Gap" music playlist on increasing physical activity among staff workers in the productive age group.

2 Methods

2.1 Study Design and Setting

This study employed a pre-experimental design using a One-Group Pretest-Posttest approach to examine the effect of music on physical activity among productive-age workers. The intervention involved exposure to a curated playlist titled *"Research & GAP"*. This study was conducted in March–April 2024 at the Group Staff Worker Office located in Jonggol Village, Bogor Regency, Indonesia. The intervention period lasted for one month, following the completion of proposal development and ethical clearance.

2.2 Participants and Sampling

The target population consisted of staff workers aged 18–35 years, categorized as being in the productive age group. The sampling method used was saturated sampling, where all 30 eligible workers from the group staff unit were included in the study due to the relatively small population size. Saturated sampling is appropriate when the total population is fewer than 30 individuals, allowing for comprehensive coverage and minimal sampling error [8].

2.3 Intervention and Instruments

Participants completed a pre-test assessing their physical activity levels prior to the intervention. They were then asked to listen to the *"Research & GAP"* music playlist daily for one month. After this period, a post-test was administered to measure any changes in physical activity. The playlist was curated based on specific musical characteristics, including G chord progression, tempos between 90–178 beats per minute (BPM), and dynamic features such as *forte* and *crescendo* [9].

The instrument used to assess physical activity was the Global Physical Activity Questionnaire (GPAQ), developed by the World Health Organization (WHO) . The GPAQ consists of 16 items that evaluate physical activity across three domains: activity at work, during transportation, and for recreation. Respondents' physical activity levels were classified into three categories using the following metabolic equivalent (MET) formulas [10]:

- High activity: MET $\geq$ 3000 (calculated as 8.0 $\times$ minutes of vigorous activity $\times$ number of days)
- Moderate activity: MET $\geq$ 600 (calculated as 4.0 $\times$ minutes of moderate activity $\times$ number of days)
- Low activity: MET < 600 (calculated as 2.0 $\times$ minutes of activity $\times$ number of days)

The GPAQ instrument was selected due to its established validity (r = 0.23) and reliability (r = 0.52), both assessed in prior international research and found to be acceptable.

2.4 Data Collection

Data collection was conducted in two phases: preparation and implementation. Questionnaires were distributed via Google Forms, with respondents providing informed consent before completing the online survey. The same questionnaire was used for both pre- and post-intervention assessments.

2.5 Data Processing and Analysis

Collected data were subjected to a multi-step processing workflow including editing, coding, and cleaning to ensure quality and consistency. Statistical analyses were conducted using both univariate and bivariate methods. Univariate analysis described the distribution of each variable, including frequency, percentage, mean, median, standard deviation, interquartile range, and range. Bivariate analysis was performed to evaluate differences in physical activity before and after the intervention using the Wilcoxon Signed-Rank Test, appropriate for non-parametric paired data. A significance level of $p < 0.05$ was used to determine statistical significance.

3 Result

3.1 Respondent Characteristics

This study involved a total of 30 respondents from the Group Staff Worker label, all aged 18–35 years. As shown in Table 1, the majority of participants were male (n = 23, 76.7%), while females accounted for 23.3% (n = 7). In terms of age, 22 respondents (73.3%) were under the age of 25, and 8 respondents (26.7%) were between 25–30 years.

Table 1. Respondents characteristics (N=30)

Variable	Frequency	Percentage
Age		
<25 years	22	73.3
25-30 years	8	26.7
Gender		
Male	23	76.7
Female	7	23.3

3.2 Pre- and Post-Test Physical Activity Levels

Participants' physical activity levels were measured using the Global Physical Activity Questionnaire (GPAQ), and categorized into three levels based on MET scores: low (<600), moderate (600–3000), and high (>3000). Prior to the intervention, 17 participants (56.7%) were classified as having low physical activity levels, and 13 participants (43.3%) had moderate levels. After one month of intervention using the "Research & GAP" music playlist, a significant change was observed: 26 participants (86.7%) achieved moderate activity levels, while only 4 (13.3%) remained at the low level.

Table 2. Physical activity level before and after intervention

Activity Level	Pre-Test	Post-Test
	n (%)	n (%)
Low Physical Activity	17 (56.7)	4 (13.3)
Moderate Physical Activity	13 (43.3)	26 (86.7)

3.3 Descriptive Statistics of Key Variables

The descriptive statistics of age, pre-test GPAQ scores, and post-test GPAQ scores are shown in Table 3. The mean GPAQ score increased significantly from pre-test (M = 722.33, SD = 388.32) to post-test (M = 1305.20, SD = 720.78), indicating improvement in physical activity levels following the intervention.

Table 3. Descriptive statistics of study variables

Variable	Min	Max	Mean ± SD	95% CI
Pre-Test GPAQ	360	1680	722.33 ± 388.32	578.53 – 866.14
Post-Test GPAQ	480	2880	1305.20 ± 720.78	1032.02 – 1578.38

3.4 Normality Test

A Shapiro-Wilk test was performed to assess the normality of the GPAQ score distribution. The pre-test and the post-test GPAQ data were not normally distributed ($p < 0.05$), as shown in Table 4.

Table 4. Shapiro-Wilk Normality Test Results

Variable	Shapiro-Wilk	Interpretation
Pre-Test GPAQ	0.000	Not Normally Distributed
Post-Test GPAQ	0.013	Not Normally Distributed

3.5 Bivariate Analysis: Wilcoxon Signed-Rank Test

Given the non-normal distribution of the post-test scores, a Wilcoxon Signed-Rank Test was used to compare pre- and post-intervention GPAQ scores. The test revealed a statistically significant difference between pre-test and post-test physical activity levels ($p < 0.001$), indicating that the intervention using the "Research & GAP" playlist was effective in increasing physical activity.

Table 5. Wilcoxon Signed-Rank Test Results

Comparison	p-value
Post-Test vs Pre-Test GPAQ	0.000

4 Discussion

This study investigated the influence of the "Research & GAP" music playlist on increasing physical activity among individuals in the productive age group working in a creative office setting. The results demonstrated a statistically significant increase in physical activity levels after a one-month intervention, with a p-value of 0.000 indicating a strong effect of music on physical behavior. This finding aligns with previous research that highlights the psychological and physiological benefits of music in enhancing task performance and engagement in physical activity [6].

The pre- and post-test data, measured using the Global Physical Activity Questionnaire (GPAQ), revealed a shift from predominantly low physical activity (56.7%) to moderate physical activity (86.7%) after the music intervention. This supports findings from a study by Lesiuk, which observed that listening to music during work improved both mood and task performance among employees aged 19–35 years—a demographic similar to the one studied here. The present study's participants, mostly under 25 years old, reported higher energy levels and engagement in physical movement while listening to the curated playlist, which consisted of upbeat songs with G chord progression and tempos ranging from 90–178 BPM [11].

The impact of music on physical activity is rooted in its neurological and emotional influence. As supported by research from Pulio, solfeggio frequencies—particularly those near 396 Hz—are associated with emotional release and enhanced motivation. The relative G tone used in this study's playlist closely approximates this frequency range, potentially contributing to mood regulation and improved physical energy. Music activates the auditory pathway beginning at the cochlea and extending to the auditory cortex, where it stimulates neural responses that affect both motor activity and emotional states. This stimulation is known to increase dopamine release, which enhances mood and reduces perceived fatigue, thereby encouraging more physical activity [7] [12].

Furthermore, the findings echo earlier studies on music and sports performance. For example, Karageorghis and Priest found that cyclists increased their speed by 8.5% when accompanied by military music [13]. Similarly, Chen concluded that pitch, dynamics, and tempo significantly influence athletic performance. These factors were deliberately incorporated into the "Research & GAP" playlist to promote movement and motivation [14]. The WHO has reported that globally, 1 in 4 adults does not engage in sufficient physical activity [10]. In Indonesia, data from 2013 show that 26.1% of the population is categorized as physically inactive—a statistic that highlights the urgent need for innovative interventions, such as music-based programs, to stimulate active lifestyles [15].

In the current study, the mean GPAQ score increased from 722.33 METs to 1305.20 METs, reflecting improved energy expenditure. This change not only exceeds the WHO's minimum recommendation of 600 METs/week but also demonstrates progress toward the goal of 1500–3000 METs/week for optimal health benefits. The physiological mechanisms behind this improvement are well documented; listening to music triggers a cascade of neural signals involving the hypothalamus, medial geniculate nucleus, and cerebral cortex, which coordinate emotional, autonomic, and motor responses [16].

Additional studies have shown that self-selected music improves endurance, accelerates heart rate recovery, and positively affects cardiovascular and immune function [17]. Music's psychophysiological effects—including reduced heart rate and blood pressure, and enhanced oxygen uptake—further reinforce its role in promoting health and fitness.

5 Conclusion

The significant increase in physical activity following exposure to the "Research & GAP" music playlist supports the hypothesis that music can serve as a practical and enjoyable intervention to improve health outcomes among sedentary workers in creative office settings. The Wilcoxon Signed-Rank Test confirmed the effectiveness of this approach ($p < 0.05$), thus rejecting the null hypothesis (Ho) and accepting the alternative hypothesis (Ha): music positively influences physical activity levels in the productive age group. These findings suggest that integrating tailored music into daily routines could be an effective strategy to counteract physical inactivity, particularly among young workers in sedentary occupations.

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