

Personality Traits of University Students - A Covariate of Physical Activity in Indian Context

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Abstract

Moderate-to-vigorous-intensity physical activity performed persistently, has confirmed the provision of physical, & psychological benefits. Percentage of people performing physical activity in order to reap these benefits is limited. Bearing this in mind, a strong understanding of what elements are connected with physical activity is required. Physical activity might be influenced by specific personality factors (including openness, conscientiousness, extraversion, agreeableness, and neuroticism) as per research. The current study aimed to establish an association between varying personality traits and physical activity of university students. All the participants completed self-report measures of the Big Five Inventory (BFI) & International Physical Activity Questionnaire - Short Form (IPAQ - SF). A correlation analysis revealed positive association between the personality dimensions of extraversion, agreeableness, conscientiousness, and openness with physical exercise. The results of the study suggest that there is a relationship between personality traits and physical activity levels, and that future interventions aimed at promoting physical activity should take into account individual personality traits and other relevant factors.

Keywords: Personality traits, physical activity, five-factor model, openness, conscientiousness, extraversion agreeableness, neuroticism

Introduction

Physical inactivity is a major societal issue with far-reaching repercussions. Physical inactivity increases the probability of experiencing unfavourable health conditions, particularly major Noncommunicable Diseases (NCD) such as coronary heart disease, cancer, and type 2 diabetes, as well as lowering one's life expectancy (Winzer et al., 2018; Sanchis-Gomar et al., 2015; Verboven et al., 2019). NCDs account for more than 73% of global fatalities, and physical inactivity contributes significantly to this figure. (Ritchie et al., 2019) There are numerous causative factors for mortality, most notably those connected to dietary preferences and lifestyle influences (inclusive of physical activity, blood pressure, body mass index, food intake, and blood sugar); smoking; air pollution, both within and outside the house; environmental circumstances such as provision of clean water; and protected sex (for HIV/AIDS prevention). In conjunction with this, Physical inactivity may increase health-care expenditures and reduce productivity, inflicting a multibillion-dollar economic burden on countries worldwide. (Anderson et al., 2019; Ding et al., 2016) Physical inactivity has also shown to significantly predict decreases in muscle strength, walking speed, and impairments associated with mobility. (Gaetano, 2016; Abe et al., 2019;) Regardless of the myriad health benefits of regular physical exercise (Jakicic et al., 2019), the preliminary health data shows that nearly a fourth of the world's adult population is inadequately active as opposed to physical activity recommendations guidelines. (Kraus et al., 2019; Physical Activity, 2022)

Physical inactivity not only affects physical health but also mental health. Studies have shown that physical activity can positively impact mental health by reducing symptoms of anxiety and depression, improving mood, and increasing cognitive function (Stathopoulou et al., 2006; Wegner et al., 2014). On the other hand, physical inactivity has been associated with an increased risk of mental health issues, such as anxiety, depression, and stress (Mammen & Faulkner, 2013; Teychenne et al., 2010). Additionally, physical inactivity has been linked to poor sleep quality, which can further affect both physical and mental health (Kredlow et al., 2015). Therefore, it is crucial to promote physical activity and reduce physical inactivity to improve overall health and well-being.

There is an ever increasing need to attach greater importance towards encouraging and maintaining an active lifestyle in the early stages of life, especially during the onset of middle age. Effective & well-targeted health interventions could be one way to achieve this. However, the efficacy and usability of these interventions are

contingent on the clear identification of the factors driving specific physical activity behaviour. (Gao et al., 2019; Bauman et al., 2013) In order to have an in-depth knowledge of this research area, the current study investigated the influence of personality traits and the constancy of physical activity participation in male and female university students.

Moreover, understanding the factors that drive physical activity behaviour is not only important for designing effective interventions, but also for developing policies that promote physical activity at a population level. For example, policies related to urban planning, transportation, and workplace environments can influence the availability and accessibility of opportunities for physical activity, and may in turn impact the prevalence of physical activity in a given population.

Therefore, research on the influence of personality traits on physical activity participation can inform not only individual-level interventions but also broader public health initiatives. By identifying which personality traits are associated with physical activity, interventions can be tailored to individuals with different personality profiles, increasing the likelihood of success. Additionally, this research can inform the development of policies and programs that take into account the unique needs and preferences of different subpopulations based on their personality traits.

Personality & Physical Activity

At present the existing data suggests a modest relationship between personality and physical activity (Rhodes & Smith, 2006; Wilson & Dishman 2015) along with, physical inactivity (Liao et al., 2022) and sedentary behaviour (Allen et al., 2017)

Some natural variation in physical activity can be attributed to theories (Eysenck's personality theory, Gary's theory of personality) on personality and observational analysis. (Tolea et al., 2019; Gao et al., 2019; Rhodes & Smith, 2006) Rhodes and Smith (2006) analysed 35 samples and discovered modest positive correlations between conscientiousness ($r = .20$) & extraversion ($r = .23$), and physical activity, and a moderate negative correlation with neuroticism ($r = -.11$). They employed a narrative technique to analyse possible moderators of these results and reported that sex, age, and research design did not seem to alter the findings.

At a young age, personality is very malleable and emerges as a consequence of interactions between temperamental and environmental inputs. Individual variations are rooted in personality characteristics, which influence the growth and possibly the consistency of psychosocial determinants of physical exercise habits (e.g., social cognitions and exertion-induced emotional reactions). Personality may also assist with explaining or modifying regularly observed connections between physical exercise and many elements of mental health. Moreover, those very associations could provide a foundation for further research into genetic factors associated with personality and physical activity. Understanding the influence of personality factors might be advantageous for fitness trainers and other professionals in this area as they build exercise programmes and work with clients to increase physical activity adherence.

The psychology of physical activity behaviour is influenced by one's personality. The five-factor model (FFM) has been the most widely acknowledged paradigm for many decades. This model proposes that personality characteristics impact psychosocial elements such as attitude, perceptions about peer pressure from others, and self-efficacy in a manner that determines exercise choices and adherence tactics. (Kilpatrick et al., 2021) This widely accepted system postulates that the core personality of every individual can be categorised along five bipolar dimensions: (a) Openness / Closedness; (b) Conscientiousness / Directedness; (c) Extraversion / Introversion; (d) Agreeableness / Antagonism. (e) Neuroticism / Emotional Stability;

Physical activity is any physiological action that subsequently increases utilisation and is performed by skeletal muscles. (Caspersen et al., 1985) Physical activity consists of several factors (including duration, intensity, frequency, and form), making its evaluation challenging. In accordance with this personality paradigm, neuroticism, extraversion, and conscientiousness have been shown to be reliable predictors of physical activity. (Wilson & Dishman 2015; Kekäläinen et al., 2020; Stieger et al., 2020) Individuals with elevated levels of anxiety (McDowell et al., 2019), anger and hostility, depression, and loneliness may be less inclined towards participating in physical exercise than individuals with lower scores on these traits. (Malmir & Nedaei, 2019) But among the extraversion traits, activity and sensation seeking got the most evidence as positive predictors of physical exercise. (Minkwitz et al., 2016) A meta-analysis of conscientiousness and health-related behaviours revealed that among 194 studies evaluated, being achievement-oriented and persistent, structured, efficient, regimented, and self-controlled were the strongest predictors of physical activity. (Bogg & Roberts, 2004) In relation to physical exercise, more contradictory outcomes have been observed for the openness attribute of personality. (Sutin et al., 2016)

It is possible to draw the inference on the basis of the accumulated data and research, that self-reported physical activity has a consistent positive connection, although a minor one, with extraversion and conscientiousness. In addition, there seems to be a negative link between neuroticism and the amount of self-reported physical activity. Consistent correlations involving personalities and physical activity highlight the potential of utilising personality to identify individuals who could be at risk for inactivity or poor exercise adherence. With regard to the Big Five personality characteristics, neuroticism seems to indicate a risk for inactivity, but increases in conscientiousness & extraversion may serve as a protective factor against inactivity. Additionally, it has been suggested that personality qualities play a role in the physical activity for up to one in ten people, and that its importance increases with age due to diminished possibilities for staying active. (Wilson & Dishman 2015; Kern et al., 2010)

Objective Measurement Techniques: Physical Activity

Although there is a great deal of data reporting on the correlations between personality and self-reported physical activity, there is a lack of literature reporting on these correlations using objective measurement techniques (including accelerometers, pedometers etc.). In light of the relatively weak correlations that exist between self-reported and objectively measured levels of physical activity in general, it is critical to investigate whether or not physical activity measurement influences the ways in which personality and physical activity are observed to be related to one another. One research evaluating cross-sectional connections between personality traits & physical activity in a sample (n = 298) of female students found varying associations depending on physical activity assessment. (Wilson et al., 2015) Both extraversion and neuroticism were associated with higher levels of perceived physical activity, but only the latter was associated with higher levels of objective physical activity as assessed by an accelerometer. Moreover, self-reported physical activity demonstrated a weak to moderate correlation with objectively assessed physical activity. Another research of older adults assessed sedentary time and physical activity in relation to personality characteristics using the activPAL activity monitor. No significant relationships were observed between personality and physical activity as evaluated by step count, but there were significant negative correlations between sedentary time & Agreeableness, Conscientiousness, and Openness. Device-based physical activity metrics, such as accelerometers, provide advantages over traditional methods like surveys because they can track activity on a minute-by-minute basis, even for low-intensity activities. (Kraus et al., 2019) Thus, the incorporation of device-based physical activity metrics may contribute to the advancement of personality and physical activity research.

Methods

The present data was taken from a sample of university students located in various Indian states. The sample (males=225; females=275; N=500) constituted randomly selected male and female participants with varying levels of education. Participants had to meet three criteria to be included in the study: (1) be between the ages of 18 and 27; (2) be presently residing in India; and (3) be able to read and write English. Both online and offline channels were used to circulate the survey. The URL and QR code of the online survey, alongside a brief description of the research, were put on LinkedIn & WhatsApp & printed on flyers for promotional purposes. Altogether, 500 students (mean age = 20.06 ±2.2 years old) took part in this study. The majority, consisting of 198 participants, were born in 2004 (See Table 1).

Table 1	
<i>Demographic Distribution, Note : N = 500</i>	
Variables	Frequency
Age	
18 - 22	435 (87%)
23 - 27	65 (13%)
Gender	
Male	225 (45%)
Female	275 (55%)
Others	0 (0%)
Educational Level	
None	0 (0%)
Undergraduate	397 (79.45%)
Postgraduate	82 (16.4%)
Ph.D Scholar	21 (4.%)
Post - Doctoral Scholar	0 (0%)
Medical Condition	

Yes	16 (3.2%)
No	484 (96.8%)

According to the demographic breakdown, 87 % of the participants belong to the age range 18-22. Overall, there were 55% females and 45% males in the sample. 79.45% of the participants were at the undergraduate level. Furthermore, 96.8% of individuals reported having no medical conditions

Measures

International Physical Activity Questionnaire - Short Form (IPAQ - SF) - *For Physical Activity*
Big Five Inventory (BFI) - *For Personality Traits*

Personality Traits

The Big Five Inventory (BFI), which comprises 44-item, comprising eight items for extraversion, nine for agreeableness, nine for conscientiousness, eight for neuroticism, and ten for openness to experience. To these items respondents express their degree of agreement on a 5-point scale ranging between strongly disagree to strongly agree, was used to assess personality characteristics. This taxonomy has a robust component structure and supports the concept that personality trait characteristics are shared by all humans. (McCrae & Terracciano, 2005) All five BFI measures were found to have sufficient internal consistency reliabilities (mean α values of 0.77, 0.78, and 0.81). It was hypothesised that the BFI is a succinct evaluation of the Big Five personality traits that produces trustworthy and accurate findings. (Major et al., 2007)

Physical Activity

The IPAQ long form is a 27-item self-reported assessment of physical activity for use with 15- to 69-year-old people. Self-reported data on total moderate and vigorous physical activity are evaluated within this scale. The IPAQ may be used professionally and in demographic research that examines the levels of physical activity between international populations. In this study the short version of IPAQ was used, which has seven items. The questions refer to the amount of time spent engaging in moderate physical activity, vigorous physical activity & walking throughout the last week. In general, the IPAQ surveys generated consistent data (Spearman's rho clustered at 0.8), with similar results from the short and long versions.

Analysis

A Pearson correlation coefficient was computed to assess the linear relationship between personality traits and physical activity. Personality traits and the frequency with which men and women engage in varying levels of physical activity were also correlated using a Pearson's product moment analysis.

Results

Positive associations were found between the personality dimensions of extraversion, agreeableness, conscientiousness, and openness with physical exercise (See Table 2). To analyse the linear relation between personality traits and physical activity, a Pearson correlation coefficient was generated with each of the personality factors. A weak positive correlation was observed between the personality factor openness & physical activity, $r(499) = [.13]$, $p < .05$; as well as agreeableness & physical activity, $r(499) = [.089]$, $p < .05$. Additionally, there was a weak positive correlation between the personality factor conscientiousness & physical activity $r(499) = [.09]$, $p < .05$; as well as extraversion and physical activity $r(499) = [.14]$, $p < .05$. No correlation was observed between neuroticism and physical activity.

Table 2: Correlation matrix representing the relation between personality traits and physical activity

	Physical Activity	Extraversion	Agreeableness	Conscientiousness	Neuroticism	Openness
Physical Activity	1	0.14**	0.08**	0.09**	-0.11	0.13**
Extraversion	0.14**	1				
Agreeableness	0.08**		1			
Conscientiousness	0.09**			1		
Neuroticism	-0.11				1	
Openness	0.13**					1

Significant at 0.05 level.

To analyse the linear relation between personality traits and levels of physical activity level in both males &

females (See Table 3), a Pearson correlation coefficient was generated with each of the personality factors. A positive correlation was observed between the personality factor openness & moderate physical activity in females, $r(96) = [.314]$, $p < .05$; as well as agreeableness & low physical activity females, $r(45) = [.216]$, $p < .05$. Whereas a positive correlation was observed between the personality factor agreeableness & low physical activity in males, $r(43) = [.318]$, $p < .05$.

Table 3: Correlational analysis between personality traits & levels of physical activity of males and females

	Physical Activity			Physical Activity		
	High	Moderate	Low	High	Moderate	Low
Personality	Males			Females		
Openness	0.105	0.092	0.178	-0.042	.314**	0.166
Conscientiousness	0.022	0.163	-0.069	-0.042	-0.024	-0.068
Extraversion	0.158	0.142	-0.069	0.017	0.161	-0.007
Agreeableness	0.07	0.158	.318**	-0.187	0.164	0.216**
Neuroticism	-.118	0.096	-0.262	0.033	-0.041	-0.006

Significant at 0.05 level.

Discussion

Based on the results of the Pearson correlation coefficient, it can be concluded that there is a weak positive relationship between personality and physical exercise. The findings suggest that individuals who score higher in extraversion, agreeableness, conscientiousness, and openness are more likely to engage in physical activity. However, it is important to note that these results should be interpreted with caution as the correlation observed is weak. While the results suggest a relationship between personality and physical activity, they do not necessarily indicate a causal relationship. Further research is needed to determine the direction and strength of the relationship between personality and physical activity. It is also worth mentioning that the absence of a significant correlation between neuroticism and physical activity is notable. This could suggest that individuals who score higher in neuroticism may not be as likely to engage in physical activity. This result could be used to inform future interventions aimed at promoting physical activity among individuals who score higher in neuroticism.

Additionally, results of the Pearson correlation coefficient, also demonstrate that there is a positive relationship between personality and physical activity levels in both males and females. It is possible that a variety of individual and societal factors may influence the relationship between personality and physical activity levels in females. For example, access to resources and opportunities for physical activity, attitudes and beliefs towards physical activity, and cultural and societal expectations and norms may play a role. Individual personality traits, such as openness, may also influence physical activity levels in females. For example, individuals who score higher in openness may be more likely to seek out new experiences and engage in physical activity, while those who score higher in agreeableness may be less likely to engage in physical activity due to a preference for conformist behaviours or a lack of assertiveness. Whereas, Individual personality traits, such as agreeableness, can influence physical activity levels in males. For example, individuals who score higher in agreeableness may be less likely to engage in physical activity due to a preference for conformist behaviours or a lack of assertiveness, while those who score higher in openness may be more likely to seek out new experiences and engage in physical activity. It is also possible that the relationship between personality and physical activity levels in males may be influenced by gender norms and expectations, which may differ between males and females. For example, traditional gender roles and expectations may lead to different levels of physical activity among males and females.

Conclusion

This study revealed novel relationships between personality characteristics and physical activity among college students. Researchers found extraversion, agreeableness, conscientiousness, and openness to correlate with physical activity. This study's results may aid in the identification of individuals at increased risk of becoming physically inactivity and in the development of gender- and personality-specific campaigns for health promotion and physical activity programmes. Given the potential influence of gender norms and expectations on physical activity levels, it may be beneficial to develop gender-specific approaches to promoting physical activity. For example, interventions aimed at increasing physical activity among males may need to address cultural expectations and traditional gender roles that may discourage physical activity.

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