Original Article

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Relationship between Happiness Index and Physical Activity Level among Physiotherapy Students: A Cross-sectional Study from Dakshina Kannada, Karnataka, India

Physiotherapy Section

DEENA D SOUZA[1], SAUMYA SRIVASTAVA[2], BHOOMIKA BHAT[3]

ABSTRACT

Introduction: The happiness and Physical Activity (PA) play an important role in human life to promote healthy lifestyle.

Aim: To find out the connection between PA and happiness students, which helps in overall wellbeing and academic success.

Materials and Methods: A cross-sectional observational study was conducted among Department of Physiotherapy students of NITTE Institute of Physiotherapy, Yenepoya Physiotherapy College, Kanachur College of Physiotherapy and Alvas College of Physiotherapy in Dakshina Kannada, Mangaluru, Karnataka, India. A total of 118 students aged 18-25 years participated over a period of six months from October 2023 to March 2024. The study utilised the Oxford Happiness Questionnaire and the International Physical Activity Questionnaire (IPAQ) to assess the happiness index and PA levels. Descriptive statistics, using frequency, percentage, mean±Standard Deviation (SD) of the data. The Pearson correlation coefficient ("r") was to find out relation between happiness index and PA leave. The p-value <0.05 was considered significant.

Results: All 118 participants (mean age, 20.31±1.43 years) completed the survey. A significant relationship was found between happiness and age, with 26 (41.3%) of students aged 18-20 years feeling happy and 37 (58.7%) are not happy as compared to 35 (63.6%) of 21-24-years students are happy and 20 (36.4%) are not happy (p-value <0.05). In analysis by gender, 35 (48.6%) of females and 26 (56.5%) of males underlined their happiness levels as high and 37 (51.4%) of females and 20 (43.5%) of male underlined low happiness level. PA was positively correlated with happiness, since only 3 (8.1%) among low PA participants were happy, with 10 (45.5%) among moderate PA and 48 (81.4%) among high PA participants. Thus, age and PA had a positive effect on happiness.

Conclusion: The study's results underscore the importance of promoting PA among students to enhance their overall wellbeing. These findings align with previous research highlighting the positive correlation between exercise and mental health. However, to pinpoint the precise exercise variables, more research is necessary such as type, intensity and duration that most significantly influence happiness levels in physiotherapy students.

Keywords: Exercise, Healthy lifestyle, Mental health, Oxford happiness questionnaire

INTRODUCTION

Happiness is the emotion that encompasses being filled with joy sense and life satisfaction [1]. The many things contribute to this overall wellbeing, such as having healthy relationships, engaging in meaningful work and also enjoying personal hobbies [1]. Happiness is one of the primary human pursuits [2]. Researchers have attempted to look for happiness from a range of the emotional factor that lead to it and the cognitive evaluations of life satisfaction [2]. People's conception of happiness is a way to understanding of the mind [3]. Wellbeing, which encompasses happiness, is rather complex, as it includes, among other things, positive feelings, self-growth, social connection and meaning in life [4]. This broad perspective of wellbeing need for people to be able to go beyond just surviving and make a significant contribution to society [4]. Further, it emphasises a new aspect of mental health: rather than just being free of mental illness, it is a condition where people are able to recognise their potentials, deal with the normal stresses of life, be productive and be useful to society [4].

Psychological wellbeing is an essential component of overall wellbeing, encompassing both reflective and affective elements [5]. Reflective indicators measure satisfaction across different areas of life, while affective indicators focus on the emotional experiences that contribute to our sense of happiness [5]. Additionally, the concept of health has evolved beyond merely the absence of illness; it now includes social, mental and physical wellbeing, aligning with the World Health Organisation's comprehensive definition of health. This broader perspective highlights the significance of social conditions, emotional wellbeing and spiritual factors in fostering good health and overall wellbeing [5]. Happiness not only affects how people view themselves and their lives, but also has a significant impact on different areas such as marriage, friendships, income, work and health [6]. Focusing on elements that boost happiness in students can greatly enhance their learning capabilities, help them manage challenges and ultimately support their overall wellbeing [6].

Happiness is shaped by a variety of factors, such as personality traits, income inequality, mental health and social relationships [7]. Lifestyle factors, including nutrition and PA, along with biological processes like neuroendocrine, inflammatory and metabolic pathways, are key mechanisms that connect happiness to health [8]. Teenagers who engage in PA are generally thought to report feeling happier [9]. Regular exercise has numerous physiological advantages, including bettering blood pressure, lipid profiles, carbohydrate metabolism and weight loss [10]. Additionally, PA has been linked to reducing depression, anxiety and stress and is noted to be as effective as medication for depression, with lower relapse rates [10]. These results demonstrate how crucial PA is for fostering both mental and physical health [11].

Despite these benefits, there has been a noticeable shift in recent years towards more sedentary lifestyles among children, leading to a decline in PA [12]. Initial studies indicated that exercise effectively decreases depression and increases happiness [13]. While younger

generations prioritise healthy lifestyles, adults overall are showing declining trends in healthy habits [14]. PA is crucial for human health, impacting development and overall wellbeing [15].

While physical exercise has shown promise in reducing depressive symptoms and enhancing overall wellbeing, few studies have focused specifically on its impact on happiness [16]. The relationship between college students' mental health and their levels of physical exercise and mindful self-awareness is revealed by the cross-sectional web-based study among Iranian medical students [17].

In the proposed study, to find out the connection between PA and happiness in students, which helps in overall wellbeing and academic success. This study explored the relationship between PA levels and the happiness index among physiotherapy students in Dakshina Kannada.

MATERIALS AND METHODS

Following strobe guidelines, a cross-sectional observational study was conducted from October 10, 2023, to March 25, 2024, in Department of Physiotherapy students of NITTE Institute of Physiotherapy, Yenepoya Physiotherapy College, Kanachur College of Physiotherapy and Alvas College of Physiotherapy in Dakshina Kannada, Mangaluru, Karnataka, India. Ethical clearance for the proposed study was acquired from (Deemed to be University) Institutional Ethical Committee of the deemed university in Dakshina Kannada, Mangaluru, Karnataka, India (Ref: NIPT/IEC/Min/2023-2024, dated 26-02-2024).

Inclusion criteria: Only physiotherapy students aged 18 to 25 years, of both gender, students who are actively attending classes during the study period and students who are willing to complete the questionnaire and participate in PA assessments were included in the study.

Exclusion criteria: Students who have previously participated in a similar study, students who have any physical or mental health condition that may affect their ability to participate in PA or respond to the questionnaire accurately and students currently on long-term medication that may affect their PA levels or mood were excluded from the study.

Sample size calculation: Participants were selected through convenient sampling based on predefined criteria. Sample size was calculated by using formula:

$n=(1-r^2)\ *(Z\ 1-2/2+Z\ 1-beta)^2\ r^2$

where,

alpha=Significance level (5%)

r=Karl Pearson Correlation coefficient (0.25) [18];

1-beta=Power (80%)

$n=(1-0.252)\ *(1.96+0.84)^2\ (0.25)^2=118$

Study Procedure

The study focused on two variables: PA level (independent variable) and happiness index (dependent variable). PA was measured using the IPAQ, which assess vigorous, moderate and walking activities. The happiness index was measured using Oxford Happiness Questionnaire, for individual wellbeing.

In this study, data collection was done using a questionnaire distributed to participants. The questionnaire was included with demographic information, PA levels and the happiness index. The IPAQ have seven items, open-end questions surrounding individuals' PA over the past seven days. This measure assesses the types and intensity of PA and sitting time that people do as their daily lives are considered to estimate total PA in Metabolic Equivalent Task (MET)-min/week and time spent sitting. Convert all activity to minutes before calculating MET minutes. It is recommended that activity bouts of greater than three hours are truncated. That is to say that a bout cannot be longer than three hours (180 minutes). This means that in each category a maximum of 21 hours of activity are permitted a week (3 hours×7 days). To calculate MET minutes a week, multiply the MET value given (remember: walking=3.3, moderate activity=4, vigorous activity=8) by the minutes the activity was carried out and again, by the number of days that that activity was undertaken. For example, if someone reports walking for 30 minutes five days a week then the total MET minutes for that activity are 3.3×30×5=495 met minutes a week. You can add the MET minutes achieved in each category (walking, moderate activity and vigorous activity) to get total MET minutes of PA a week [19].

Oxford Happiness Questionnaire have 29 questions which students have to answer the answer should indicate how much you agree or disagree with each statement by entering the corresponding numbers in the blank after each statement, according to following scale: 1=strongly disagree, 2=moderately disagree, 3=slightly disagree, 4=slightly agree, 5=moderately agree and 6=strongly agree. Items marked with (R) should be scored in reverse; for example, if a participant gives a "1," it will change to "6," "2" change to "5," "3" change to "4," "4" change to "3," "5" change to "2," and "6" change to "1" cosider this as step 1.

And add the number for all 29 questions, (use converted numbers for 12 items that are reverse scored (step 2). At last divide by 29. So, your happiness score is calculated as the total divided by 29 [20].

The statistical analysis and data entry were performed using paper and pen, with a laptop available as an alternative for participants who were unable to use digital means. The questionnaire was shared through social media and email to encourage wide participation from various physiotherapy colleges in Dakshina Kannada. Responses were collected through online forms to collect the feedback collection.

STATISTICAL ANALYSIS

Descriptive statistics, such as frequency, percentage, mean and SD, was used to summarise the data gathered. The link between the degree of PA and the happiness index will be determined using the Karl Pearson correlation coefficient ("r"). Spearman's ratio will be utilised to determine the relationship if the data does not follow a normal distribution. The p-value <0.05 is statistically significant. The Statistical Package for the Social Science Software (SPSS Inc.; Chicago, IL) version 29.0.10 was used to analyse the data.

RESULTS

The study sample consisted of 118 students with a mean age of 20.31±1.43 years, divided into two age groups, with a predominantly female gender distribution. A detailed overview of the demographic characteristics of participants is given in [Table/Fig-1].

Variable	Category	N (%)
Age (years)	18-20	63 (53.4)
	21-24	55 (46.6)
Gender	Male	46 (39)
	Female	72 (61)

[Table/Fig-1]: Demographic characteristics of participants.
N: Number of participants

The analysis of happiness levels across age groups revealed a notable difference. Among participants aged 18-20 years, 26 (41.3%) reported feeling happy, compared to 37 (58.7%) who were unhappy. In contrast, a significantly higher proportion of participants aged 21-24 years, 35 (63.6%), reported feeling happy. A chi-square test confirmed a statistically significant association between age and happiness (p-value=0.015), indicating that older participants in this study were more likely to experience higher levels of happiness [Table/Fig-2].

Variable	Category	Total happiness index score			Category of Physical Activity (PA)			
		Happy	Not happy	p-value	Low	Moderate	High	p-value
		N (%)	N (%)		N (%)	N (%)	N (%)	
Age (years)	18-20	26 (41.3)	37 (58.7)	0.015 (Sig)	27 (42.9)	12 (19.0)	24 (38.1)	0.008 (HS)
	21-24	35 (63.6)	20 (36.4)		10 (18.2)	10 (18.2)	35 (63.6)	
Gender	Female	35 (48.6)	37 (51.4)	0.402 (NS)	23 (31.9)	18 (25.0)	31 (43.1)	0.055 (NS)
	Male	26 (56.5)	20 (43.5)		14 (30.4)	4 (8.7)	28 (60.9)	

[Table/Fig-2]: Age and gender association of participants.
Sig: Significant; HS: Highly significant; NS: Not significant

A gender-based analysis of happiness revealed that 48.6% of females reported high happiness levels, whereas 37 (51.4%) exhibited lower happiness levels. In contrast, males demonstrated a slightly different distribution, with 26 (56.5%) reporting high happiness and 20 (43.5%) reporting relatively lower levels. The chi-square test showed no significant difference in happiness between genders (p-value=0.402), indicating that gender did not significantly impact happiness levels in this sample [Table/Fig-2].

Regarding PA, those aged 21-24 years have the highest proportion of high activity levels, with 35 (63.6%) compared to 18-20 years age group, which exhibited a more evenly distributed pattern across low 27 (42.9%), moderate 12 (19.0%) and high 24 (38.1%) levels. The relationship between age and PA is highly significant (p-value =0.008). Males show a greater tendency for high activity levels, with 28 (60.9%) compared to females 31 (43.1%). Although males have a lower percentage of moderate activity (4, 8.7%) than females (18, 25.0%), the association between gender and PA was not statistically significant (p-value=0.055).

The IPAQ scores were calculated for each participant to quantify their PA levels [Table/Fig-3]. The IPAQ scores had a mean of 4076.74 MET-min/week (SD=4969.51), indicating substantial variability in PA levels among participants. The median IPAQ score of 3405.00 represents the middle value of the dataset, separating the lower and higher halves of the PA distribution. The interquartile range of 0.00–5760.00 highlights the spread of the data, showing that 50% of the participants had IPAQ scores ranging from 0.00 to 5760.00 MET-min/week.

Physical activity (PA) level	N (%)	Total happiness index score		Total happiness index score and IPAQ score Chi-square test p-value	Total happiness index score and IPAQ score correlation (r)
		Happy (%)	Not Happy (%)		
Low	37 (31.4)	3 (8.1)	34 (91.9)	p=0.0001 (HS)	0.392
Moderate	22 (18.6)	10 (45.5)	12 (54.5)		
High	22 (18.6)	48 (81.4)	11 (18.6)		

[Table/Fig-4]: The association between Physical Activity (PA) levels and happiness.
N: Number of participants; Sig: Significant; HS: Highly significant

The data points appear widely dispersed, suggesting no clear linear correlation between the two variables. While some individuals with higher IPAQ scores have higher happiness scores, others with similar IPAQ scores show lower happiness levels. The distribution indicates that PA alone may not strongly predict happiness and other factors could influence the happiness index. These variables were significantly and positively correlated (r=0.392; p-value <0.05).

DISCUSSION

This study investigated the connection between physiotherapy students' levels of PA and happiness. The findings from this research underscore a positive correlation between higher levels of physical activity and greater happiness, providing valuable insights into the role that physical health plays in overall wellbeing.

The analysis, which involved 118 participants aged 18 to 25 years, revealed notable trends regarding the impact of PA on happiness. One significant observations was the higher levels of happiness among students in the 21-24 years age group compared to their younger counterparts. This trend suggests that as students advance in their academic careers, they may develop a more balanced approach to managing both academic pressures and personal wellbeing. Such a balanced lifestyle, which could include greater engagement in PA, may contribute to better emotional regulation and overall happiness.

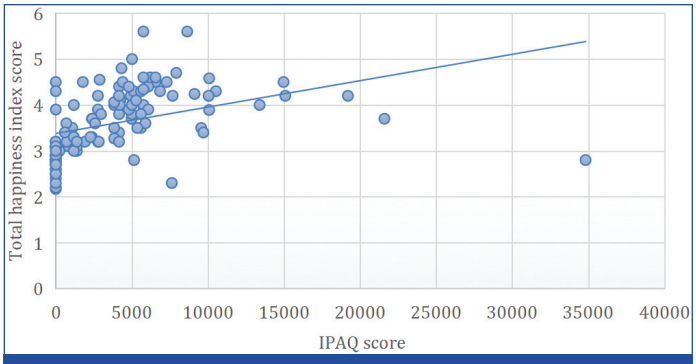
Variable	N	Minimum	Maximum	Mean±SD	Median	IQR	
						Lower	upper
Total happiness index score	118	2.17	5.60	3.61±0.72			
IPAQ score	118	0.000	5760.000	4076.74±4969.51	3405.00	0.000	5760.000

[Table/Fig-3]: Analysis between Physical Activity (PA) levels and happiness.
N: Number of participants; IQR: Interquartile range

The total happiness index scores for each participant ranged from a minimum value of 2.17 to a maximum of 5.60. The mean score is 3.61, with an SD of 0.72, indicating the spread of values around the mean. Additionally, a significant positive correlation was found between PA levels and happiness.

The distribution of PA levels and happiness index scores is presented in [Table/Fig-4]. Among participants with low PA, a small proportion, 3 (8.1%), reported being happy, while the majority, 34 (91.9%), reported not being happy. In contrast, participants with moderate PA levels showed a notable happiness rate, with 10 (45.5%) reporting being happy and 12 (54.5%) reporting not being happy. However, a significant proportion, 48 (81.4%), of participants with high PA levels reported being happy, whereas a minority, 11 (18.6%), reported not being happy. The chi-square test revealed a significant association between PA level and happiness, with a p-value of 0.0001, indicating a highly significant relationship. Moreover, the correlation between PA level and happiness score was moderate (r=0.392), suggesting a positive relationship between higher PA and happiness.

The scatter plot shows the relationship between the IPAQ score (physical activity level) and the total happiness index score [Table/Fig-5].



[Table/Fig-5]: Total happiness index score and International Physical Activity Questionnaire (IPAQ) score scatter plot.

Gender did not show a significant impact on happiness levels in this sample. Although males reported a slightly higher percentage of happiness compared to females, the difference was not statistically significant. This was consistent with previous research indicating that while gender differences exist in some psychological aspects, the relationship between happiness and PA appears to be universal, regardless of gender [21].

A significant finding of the study was the strong positive correlation between PA levels and happiness. Participants who engaged in high levels of PA reported the highest happiness levels, while those with low activity levels showed markedly lower happiness. This supports existing evidence that regular exercise contributes to psychological wellbeing, likely due to its effects on neurotransmitters like endorphins, which are known to improve mood and reduce stress [22].

Fisher JJ et al., previously reported similar results. The study, conducted on first-year medical students in Cyprus, found a positive correlation between vigorous PA and happiness among females [18]. This emphasises the importance of vigorous activity for female medical students' happiness, which was not observed to the same extent among males. Despite gender disparities in vigorous activity levels, overall depression prevalence among students was relatively low [18].

The results of this study provide important insights for the wellbeing of physiotherapy students. Given the nature of their profession, it is essential to recognise the benefits of PA not only for physical health but also for mental health. Encouraging students to participate in regular physical exercise can promote their academic success by enhancing their emotional stability.

Future studies should aim to include more diverse samples and explore longitudinal effects to better understand the long-term impact of PA on happiness. Furthermore, other factors such as sleep, diet and social support could also contribute to happiness and should be considered in future research to provide a more comprehensive view of the factors influencing student wellbeing.

Limitation(s)

The study's limitations do not apply to larger populations, such as the elderly or people with medical disorders, because it only included physiotherapy students between the ages of 18 and 25 who were free of medical conditions.

CONCLUSION(S)

This study highlights the significant positive relationship between PA and happiness among students. Those who were physically active or semi-active reported feeling happier than those who were not. These findings are consistent with other research demonstrating the benefits of exercise for mental health, such as reduced stress and anxiety, improved mood and overall quality of life. Promoting regular PA could effectively enhance students' happiness and wellbeing. Future research should explore additional variables to provide a comprehensive understanding of happiness determinants in student populations.

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PARTICULARS OF CONTRIBUTORS:
1. Student, Department of Physiotherapy, Nitte Institute of Physiotherapy, NITTE (Deemed to be University), Deralakatte, Mangaluru, Karnataka, India.
2. Associate Professor, Department of Physiotherapy, Nitte Institute of Physiotherapy, NITTE (Deemed to be University), Deralakatte, Mangaluru, Karnataka, India.
3. Student, Department of Physiotherapy, Nitte Institute of Physiotherapy, NITTE (Deemed to be University), Deralakatte, Mangaluru, Karnataka, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Saumya Srivastava,
Associate Professor, Department of Physiotherapy, Nitte Institute of Physiotherapy,
NITTE (Deemed to be University), P.O. 12, Deralakatte,
Mangaluru-575018, Karnataka, India.
E-mail: saumyasri2000@nitte.edu.in

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