

Psychological Well-being as Correlate of Level of Physical Activity in Young Adults

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Abstract

Scientists are discovering. However, the usefulness of psychological tests is dependent on their predictability of behavior. By providing information about the probability of a person's responses or performance (well-being), such tests may aid physical therapists in decision making. This study compared the psychological well-being (by gender) and levels of physical activity in young adults. A total of 400 participants (comprising of 200 males and females each) of ages between 18 and 30 years were conveniently drawn from selected tertiary institutions across Enugu state of Nigeria. With the administration of short form of International Physical Activity Questionnaire and Ryff's scale of psychological well-being, subjects' physical activity levels and psychological well-being were respectively measured. With males participating more in the exercise than females, one way analysis of variance (ANOVA) returned a significant difference between Gender and some subscales of psychological well-being (Autonomy, Environmental mastery and Self-acceptance). Result also showed a significant difference between physical activity can therefore be said to improve psychological well-being in a gender dependent faction.

Keywords: Psychological well-being; Physical activity; Gender

Introduction

The body's functional ability to perform vigorously with alertness, discrediting undue fatigue with ample energy to engage in leisure activities and meet physical stressors is "physical fitness". Cardiorespiratory integrity, Muscular strength and endurance, and general alertness are the overt signs of physical fitness [1]. Similarly, a psychological state of well-being, characterized by continuous personal growth, a sense of purpose in life, self-acceptance, and positive relations with others is "mental health". Mental health can also be seen to encompass both mental health and mental illness [2]. A key influence of physical fitness on mental health is seen in stress. Generally, stress is experienced when the demands placed on people exceeds the availability of resources to meet such demands. Significant sources of stress include major life events, such as divorce, death of a spouse, loss of a job, and illness in the family. These events can overwhelm a person's cognitive and psycho-motive functions, plus alter their ability to cope and effectively [3].

Over the last two decades, physical activity and its determinants for different populations have become an important topic for researchers. In recent times however, studies have been channelled and concentrated on understanding the mechanisms that facilitate participation in physical activity and increased well-being [4]. In public health, Physical activity is an important tool that clinicians explore for treatment and prevention physical and some mental health ailments; such as disease as depressive and anxiety disorders [1,5]. Though strong evidences exist to support that physically active subjects are healthier than those who do not engage in meaningful exercise, howbeit, most young-adults do not perform enough physical activity to achieve health and wellbeing benefits especially psychological wellbeing [6].

Overtime, Psychological well-being has been enhanced with low and moderate amounts of physical activity [7]. Theoretically, psychotherapists adopt this approach as grounded instrument to specifically focus on measuring multiple facets of psychological wellbeing of individuals. Included are six distinct components of positive psychological functioning. In combination, these dimensions encompass a breadth of wellness that includes positive evaluations of oneself and one's past life (Self-Acceptance), a sense of continued growth and development as a person (Personal Growth), the belief that one's life is purposeful and meaningful (Purpose in Life), the possession of quality relations with others (Positive Relations With Others), the capacity to manage effectively, one's life and surrounding world (Environmental Mastery), and a sense of self-determination (Autonomy) [8].

Participation in physical activity has been shown to produce positive moods, increase general psychological well-being and life satisfaction [9]. Increasing levels of physical activity are proven to have a positive impact on physical health and mental well-being [10]. During the last three decades, physical activity has risen to prominence as a matter of public and research interests. This can be attributed to possibly three factors; with the first being sedentary living. The second causal mechanism is the consequences of physical inactivity, with the third being the insight gained in the positive consequences of physical activity on health and the benefits it can provide [11]. So, it is valuable to address the psychological effects of Physical Activity not only to reduce sedentary living, but also due to the rising number of psychological issues in Nigeria [12]. Available studies on gender differences in states of psychological well-being have yielded contradictory findings8; underscoring the need for further studies on the impact that gender has on outcomes of various status of well-being. Developmentally, young adulthood is characterized by rapid psychological, psychosocial and physical change. This onset of puberty coincides with unprecedented social demands that often translate into significant psychological stressors, with females likely to have more negative body image and lower selfesteem than males. Several reports suggest that physical activity may buffer the negative impacts of puberty and young adulthood, sustaining psychological and physical well-being during and beyond young adulthood [13]. For this reason, this study was birthed with the aim of comparing psychological well-being according to physical activity levels of young adults in selected Tertiary Institutions in Enugu Metropolis.

Aim of Study

Using albino rats as experimental model, this study aimed at determining the relationship between the level of physical activity and psychological well-being amongst apparently healthy young adults in selected tertiary institutions in Enugu metropolis. Specifically study,

i. Determined the level of physical activity among young adults in selected Tertiary Institutions in Enugu Metropolis.

ii. Determined the level of psychological well-being of young adults.

iii. Assessed the relationship between physical activity level and psychological well-being of young adults.

iv. Ascertained if Gender influences the level of physical activity of young adults.

v. Determined if Gender influences the psychological well-being of young adults in selected Tertiary Institutions in Enugu Metropolis.

Methodology

Scope of study

Study was undertaken in Enugu, where the four (4) selected tertiary institutions are situated. Enugu is the capital of Enugu state, south-east Nigeria. It is predominantly inhabited by members of the Igbo ethnic nationality, which is the 2nd largest ethnic group in Nigeria. It has an area of 106 km². The selected institutions include; University of Nigeria, Enugu Campus (UNEC), Institute of Management and Technology (IMT), Enugu State University of Technology, Enugu (ESUT), and Enugu State College of Education Technical (ESCET).

Study design

Study utilized a convenient design approach, and targeted young adults (male and female) between the ages of 18 and 30 who are apparently healthy. This was considered suitable because it allowed the researcher to select the subjects based on their availability and willingness to participate in the study. A total of 400 participants (comprising of 200 males and females respectively) were ethically drawn from the population, and recruited as such. This was envisaged with the Taroyamen's method of sample size calculation;

 $ss=N/(1+Ne^2)$

Where ss=sample size

N=population size	
e=sampling error=0.05	
For the purpose of this study,	N=29,000
Where the population size for	
UNEC=6,000	
IMT=10,000	
ESCET=9,000	
ESUT=4,000	
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Selection criteria: Selection of subjects for participation in this study was based on:

Inclusion criteria: i. Individuals who are between the ages of 18 and 30

ii. Apparently healthy individuals

iii. Students of the aforementioned Tertiary Institution (UNEC, IMT, ESUT and ESCET).

Exclusion criteria: i. Individuals who are currently on any other exercise intervention or partake in regular exercise.

ii. Subjects below 18 years, or above 30 years of age.

Instruments for data collection

Physical activity: Self-reported Physical Activity was measured using the short form version of the International Physical Activity Questionnaire (IPAQ) which has been shown to have acceptable test-retest reliability and criterion validity [14]. The IPAQ was developed by a group of experts in 1998 to facilitate surveillance of Physical activity based on a global standard [14]. IPAQ has since become the most widely used physical activity questionnaire [15], and has a reasonable measurement property for monitoring population levels of physical activity among 18- to 65-yr-old adults in diverse settings.

Numbers of hours was calculated for respondents' participation in vigorous Physical Activity, moderate Physical Activity, and walking. Participants were classified into three categories; those getting less than 600 MET/min/wk. were considered to be insufficiently active (Low Physical Activity). Those with between 600 and 3000 MET/min/wk. were considered to be sufficiently active [16] and thus classified as Moderate Physical Activity, while those reporting more than 3000 MET/min/wk. were taken to be of High Physical Activity. All scores gotten after administering the IPAQ were expressed in MET-minutes/ week. The following values were used for the analysis of IPAQ data;

- a. Walking MET = $3.3 \times$ walking minutes' x walking days
- b. Moderate MET = $4.0 \times$ walking minutes' x walking days
- c. Vigorous MET = 8.0 × walking minutes' x walking days

d. Total Physical Activity MET = sum of Walking + Moderate + Vigorous MET minutes/week scores.

Psychological well-being

Developed in 1971 by Harold Dupuy and revised by Dupuy and John Ware in 1984, this questionnaire, psychological general wellbeing index (PGWBI) is one of the most widely used instruments for evaluating a person's psychological well-being and has been translated

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into many languages worldwide. It consists of 6 axis covering depression, anxiety, self-control, positive well-being and general health and vitality. It is an 18 item, 6 point Likert scale used to generate an overall index of psychological and general well-being. Scoring for the PGWBI ranges from 18 (poor quality of life) to 108 (good quality of life), with the scores for each item being 1 (lowest score) and 6 (highest score). This scale has also been standardized through comparisons with subjective measures of psychological well-being (life satisfaction, positive and negative affect), and is significantly linked to personality factors [8]. The PGWBI has been validated and used around the world for many studies.

Procedure

Participants were given a consent form, while orally discussing the project in detail and to designate that they can withdraw at any time. They were then assured that there was no right or wrong answer with complete anonymity were guaranteed. Then, the first questionnaire which is the International Physical Activity Questionnaire (IPAQ) was administered to individuals who met the inclusion criteria with their physical activity level determined concurrently. Participants were then asked to report the number of days and the duration of the vigorous (V), moderate (M), walking activity (W) and a combined total physical activity was scored. Following this, the Ryff's psychological well-being questionnaire was administered to ascertain the level of psychological well-being.

Ethical approval

Ethical approval was obtained from the University of Nigeria Health research ethics committee. Subjects' informed consent was obtained prior to investigation, just after the procedure and purpose of the research was clearly explained to them. Participants' privacy was maintained by using code numbers instead of names in the data presentation, whilst keeping the records confidential. Only data obtained from this study is presented and reported.

Analytical approach

Collected data is presented in tables as means and standard deviations. Statistical tests were performed using the statistical package for social sciences application (SPSS Version 21). One-way Analysis of Variance was used to find obtain differences in mean between the physical activity and Psychological Well Being of participants. P-values<0.05 were judged as statistically significant. A two-way contingency table was also used to determine the relationship between the gender and the levels of physical activity.

Results

Variable	Female (n=200)		ble Female (n=200) Male (n=200)		TOTAL (n=400)	
Age (Yrs)	Freq.	Per c. (%)	Freq.	Per c. (%)	Freq.	Per c. (%)
18-21	79	19.7 5	102	25.5	181	45.2 5
22-25	100	25	70	17.7 5	171	42.7 5
26-30	21	5	28	7	58	12

Institutio n						
UNEC	29	7.25	70	17.5	99	24.7 5
IMT	50	12.5	50	12.5	100	25
ESCET	61	15.2 5	39	9.75	100	25
ESUT	59	14.7 5	31	7.75	100	22.2 5

 Table 1: Demographic Distribution of Participants from selected

 Tertiary Institutions.

Here, 45.25% of the participants were between the ages of 18 and 21, with the males constituting 25.5% and the females 19.75%. Again, 42.75% (25% females and 17.75% males) of the participants were between the ages of 22 and 25, with the other 12% between the ages of 26 and 30. Also, 24.75% of the participants were students of UNEC, with males being 17.50% and the females 7.25%. Participants from IMT formed 25% (12.5% females and 12.5% males), same as those from ESCET. The other 22.25% (14.75% females and 7.75% males) were participants from ESUT (Table 1).





Figure 1 shows that, 25 males and 32 females had low physical activity level, with 116 males and 147 females having moderate physical activity level. 59 males and 21 females had high physical activity level. The graph further indicates that the highest number of participant who had Low and Moderate physical activity levels were females.

Physical Activity Level	Female (n=200)	Male (n=200)	Total (n=400)		
High PA (MET-in/week)	4511.72 ± 1436.48	4934.76 ± 1338.01	4607.61 ± 1417.15		

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Moderate PA (MET-in/ week)	1567.92 ± 741.09	1895.66 ± 666.92	1695.21 729.46	±
Low PA (MET-min/week)	289.43 ± 195.56	179.81 ± 213.66	230.97 210.49	±
TOTAL MET Value	1741.57 ± 1368.48	2549.81 ± 1812.98	2138.64 1650.36	±

Table 2: Metabolic Equivalent (MET-Values) of Physical Activity Levels of young adults.

Table 2 Categorizes the values of the Metabolic Equivalent into High, Moderate and Low Physical Activity Levels as obtained from the International Physical Activity Questionnaire (IPAQ-short form). As shown, the Mean Total Metabolic Equivalent was found to be 2138.64 \pm 1650.36, with mean value for Low Physical Activity being 230.97 \pm 210.49. Mean value for Moderate Physical Activity was 1695.21 ± 729.46, and that of High Physical Activity was 4607.61 ± 1417.15 .

Psychological well- being	Male (n=200)	Female (n=200)	Total (n=400)
Autonomy	12.48 ± 2.32	11.88 ± 2.47	12.17 ± 2.36
Environmental Mastery	12.07 ± 1.83	11.81 ± 2.31	11.87 ± 2.08
Personal Growth	12.70 ± 1.83	12.58 ± 1.57	12.66 ± 2.03
Positive Relationship with others	8.94 ± 3.20	9.54 ± 2.60	9.44 ± 2.93
Purpose in Life	9.83 ± 2.10	9.64 ± 1.92	9.71 ± 2.05
Self-Acceptance	12.22 ± 1.99	11.94 ± 2.00	11.96 ± 1.99
TOTAL PWB	68.24 ± 6.07	67.38 ± 5.07	67.85 ± 5.98

Table 3: Level of Psychological well-being of Young Adults.

From Table 3, it is indicated that the highest scores for participants' psychological well-being subscale is for male 12.70 \pm 1.83 (Personal Growth) and 12.58 ± 1.57 for female (Personal Growth) respectively. The subscale "Personal relationship with others" had the lowest mean score for psychological well-being. The table also indicated that the Mean Total Score for Psychological well-being for males was 68.24 \pm 6.07, while that of females was seen to be 67.38 \pm 5.07. In all the subscales, the males had higher mean values except for 'personal relationship with others' where the females had higher scores than the males. Values are expressed as Mean ± Standard Deviation; PWB=Psychological Well-Being.

PWB	PA	n	Mean SD	±	f-ratio	p-value
	High PA	78	12.46 1.93	±	3.72	0.025*
Autonomy	Moderate PA	259	12.31 2.34	±		
	Low PA	57	11.54 2.61	±		
Environmental Mastery	High PA	77	12.39 1.57	±	12.22	0.001*

	Moderate PA	252	12.06 ± 1.76		
	Low PA	57	10.88 ± 2.91		
	High PA	81	12.93 ± 1.82	1.06	0.346
Personal Growth	Moderate PA	259	12.56 ± 2.19		
	Low PA	57	12.72 ± 1.40		
	High PA	81	9.31 ± 2.92	9.02	0.001*
Positive Relationship	Moderate PA	263	10.89 ± 1.81		
	Low PA	57	9.13 ± 3.01		
	High PA	80	9.76 ± 1.90	1.93	0.147
Purpose in Life	Moderate PA	243	9.15 ± 2.40		
	Low PA	46	9.83 ± 2.20		
	High PA	81	12.35 ± 2.40	3.56	0.029*
Self-Acceptance	Moderate PA	254	11.93 ± 1.86		
	Low PA	45	11.38 ± 1.70		
TOTAL PWB	High PA	76	66.61 ± 7.34	2	0.1
	Moderate PA	224	68.01 ± 5.46		
	Low PA	45	68.80 ± 5.51		

Table 4: Relationship between Psychological well-being and Physical Activity Levels of Young Adults (Values are expressed as Mean ± Standard Deviation. PWB: Psychological Well-Being; PA: Physical Activity; *Significant P<0.005).

From Table 4, it is indicated that the highest scores for participants' psychological well-being subscale is for male 12.70 ± 1.83 (Personal Growth) and 12.58 ± 1.57 for female (Personal Growth) respectively. The subscale "Personal relationship with others" had the lowest mean score for psychological well-being. The table also indicated that the Mean Total Score for Psychological well-being for males was 68.24 ± 6.07, while that of females was seen to be 67.38 \pm 5.07. In all the subscales, the males had higher mean values except for 'personal relationship with others' where the females had higher scores than the males. Values are expressed as Mean ± Standard Deviation.

Discussion

The purpose of this study was to determine the relationship between measures of physical activity and psychological well-being; as well as explain the association that physical activity has with gender.

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From the study, result indicates significant difference between physical activity level and some psychological well-being measures (Autonomy (p=0.025), Environmental Mastery (p=0.001), Positive Relationship with others (p=0.001) and self-acceptance (p=0.029)). An LSD Post Hoc was done on the subscales with significant difference to ascertain the source of significance. The mean increased progressively from high physical activity level to Low physical activity level for some measures of psychological well-being (Autonomy, Environmental mastery), it decreased in some other measures (Purpose in life and Self-acceptance) while the other measures of psychological well-being (Positive Relationship with others personal growth) had no regular pattern. From the Total Psychological well-being score, it was found that the highest mean score was for those with low physical activity level (66.80) as those with High Physical activity level had a mean score of 66.61 while those with moderate physical activity Level had a mean score of 68.01, though the difference is not statistically significant.

Metabolic equivalent during physical activity

Findings from the results of Table 2 showed that the males had higher scores than the females in the Mean MET-values of Moderate Physical Activity and High physical activity; whereas, the females had a higher MET-value for just Low Physical Activity. The males had a mean score of 4934.76 ± 1338.01 and 1895.66 ± 666.92 for High and Moderate physical activity level respectively whereas the females had 4511.72 ± 1436.48 and 1567.92 ± 741.09 for the same levels of physical activity. The Mean Total Metabolic Equivalent was found to be 2138.64 \pm 1650.36; the mean Total Physical Activity for the males was found to be 2549.81 \pm 1812.98 whereas that of the females was 1741.57 \pm 1368.48. These higher values for the males indicates that the males perform more physical activities per week leading to the expenditure of higher amount of energy which is evident in the total mean metabolic equivalent values. This is in agreement with the study done on physical activity levels by gender and residential areas amongst Students in Akdeniz University by Pinar et al. which stated that MET activity values of male students of nearly all ages tend to be higher than those of female students [17]. This finding from the result is in contrast to the findings of this study as the Physical activity rate per week recommended by WHO is at least 1200 MET-min/week and from the result in Table 1, the mean Metabolic Equivalent for both males and females is greater than 1200 MET-min/week. This difference may be due to the sample size.

The psychological well-being of young adults

Findings from the Table 3 shows that the subscale 'Personal growth' had the highest scores for Psychological well-being with a mean of 12.70 ± 1.83 and 12.58 ± 1.57 for male and female respectively. The least mean score was found to be on Positive Relationship with others, with a mean score of 8.94 ± 3.20 and 9.54 ± 2.60 for males and females respectively. Only the subscales 'Autonomy' was found to be statistically significant. The total psychological well-being mean score of males was found to be slightly higher than that of females, with the males having a total mean score of 68.24 ± 6.07 , while females had a total mean score of 67.38 ± 5.07 , though this proved insignificant as p=0.184, which signifies that there is no significant difference in the psychological well-being between Male and Female Students. Ryff and Singer in their works on the existence of gender differences, including those related to psychological well-being had a contradictory result and a distinct lack of consensus [8]. Apart from the level of significance

of the difference between psychological well-being of males and females in their study, they found females as scoring lower than males on psychological indicators of well-being. This is in agreement with the findings of this research work.

The relationship between psychological well-being and physical activity levels

From Table 4, it is seen that the mean scores of those who have a high level of physical activity was higher than the mean scores for all other level of physical activity in 4 subscales of psychological wellbeing (Autonomy=12.46 \pm 1.93, Environmental mastery=12.39 \pm 1.57, Personal growth=12.93 \pm 1.82, and self-acceptance=12.35 \pm 2.40). These relationships of Psychological well-being with physical activity level were found to be significant for Autonomy (p=0.025), Environmental mastery (p=0.001) and Self-acceptance (p=0.029) but insignificant for Personal growth (p=0.346). The mean score for those who have a moderate physical activity level was also found to be higher the subscale 'Positive relationship with others'. This relationship was found to be significant (p=0.001). The highest mean score was also obtained for those with Low physical activity level for the subscale 'Purpose in life' but the relationship was found to be insignificant (p=0.147). 'This shows that the higher physical activity Level, the higher the Psychological well-being of the individual.

Significance of study

Study will be beneficial in providing information and evidence to buttress the relationship between physical activity level and psychological well-being. It will also inform the physiotherapy profession of the need to include physical activity in the management of psychological or psychological-related illness. The study will also inform the general public of the danger of physical inactivity and sedentary lifestyle.

Conclusion

Within the ambient of vulnerability to possible errors, this study has shown that of the participants in physical activities, males had higher values than the female folks, with females having higher participation in moderate physical activities than the males. Statistically, study also established a significant relationship between physical activity and psychological well-being among young adult. There was also a relationship between psychological well-being and Gender of young adults; with an obvious gender-dependent relationship between physical activity levels in of young adults.

Recommendations

Further investigation to access physical activity with more objective and sophisticated techniques involving pedometer or accelerometer is advised. Future research could employ in-depth interviews to better understand differences in psychological wellbeing of young adults.

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