Athens Journal of Sports - Volume 10, Issue 4, December 2023 – Pages 261-274

Basic Psychological Needs Predicting Physical Activity Participation among Young Adults

By Joseph O. Adelusi, Solomon B. Oguntuase± & Oluwatoyin M. Jaiyeoba°*

It is alarming that despite the numerous accrued benefits of physical activity participation, many young adults in tertiary institutions engage in inactive and sedentary lifestyles, which can be linked to many cases of morbidity and mortality. However, according to the self-determination theory (SDT), individuals have three basic psychological needs (BPNs) that are essential for healthy growth, development and well-being. The necessity to fulfill these BPN's can stimulate and encourage young adults to engage in regular physical activity and enhance their well-being. Therefore, this study examined the role of BPN's in predicting physical activity participation among young adults in Nigerian private university. A total of 735 students, comprising 408 males (55.5%) and 327 females (44.5%), with ages ranging from 16 to 35 years (mean = 22.8; SD = 5.42), were randomly selected from a private university in the South-west, of Nigeria. The Basic Psychological Needs in Exercise Scale (BPNES) and the International Physical Activity Questionnaire–Short Form (IPAQ-SF) were used to collect data. Data analysis was conducted using descriptive statistics, correlation and multiple linear regression analysis. The results of the study showed that the BPN's of autonomy (r =0.233, p<0.05); competence (r =0.188, p < 0.05), and relatedness (r = 0.477, p<0.05) positively correlated with physical activity participation. Additionally, the results found that 25% had low, 57.1% had moderate and 17.8% had high levels of physical activity participation among the participants. There was a significant gender difference between males and females' in their levels of participation in physical activity (t =2.866, p < 0.05), with males reporting higher mean scores than their female counterpart. Regression analysis showed that BPN's predicted physical activity participation among young adults (F (3,731) = 73.968, p < 0.05) with 23% of its variance accounted for by the independent variables. Furthermore, autonomy (ß = 0.071, t = 1.970, p < 0.05) and relatedness (ß = 0.478, t =12.589, p < 0.05) were predictors of physical activity participation with relatedness being reported as the most potent predictor. These findings provide an insight into focus the importance of satisfying the relatedness and autonomy aspects of BPN's in young adults. Developing interventions that target these identified indices can promote continuous and regular participation in physical activity.

Keywords: *basic psychological needs, relatedness, autonomy, physical activity, young adults*

*Chief Lecturer, Department of Physical and Health Education, Adeyemi College of Education, Ondo, Nigeria.
±Doctoral Student, Department of Sport Psychology, School of Physical Education and Sport Science, Tianjin University of Sport, China.
°Senior Lecturer, Department of Human Kinetics, Faculty of Education, University of Ibadan, Nigeria.

https://doi.org/10.30958/ajspo.10-4-4 doi=10.30958/ajspo.10-4-4

Introduction

"It has been well established that physical activity participation provides numerous positive health benefits encompassing physical, psychological, and social aspects, leading to enhanced health, improved life satisfaction, and optimum well-being (Lahart et al. 2019, Malm et al. 2019, Vagetti et al. 2014, Ponce de León and Sanz 2014)". Despite these numerous accrued positive health benefits of physical activity participation, many young adults in tertiary institutions engage in an inactive and sedentary lifestyle, which can be linked to various cases of morbidity and mortality. The World Health Organization (WHO) (2018) indicated that two-thirds of premature mortalities in adults are linked to young age conditions and behaviors, including smoking, heavy drinking, and physical inactivity, with a higher number of young adults not getting enough physical activity. The self-determination theory posits that the satisfaction and fulfillment of an individual's basic psychological needs can stimulate, predict, influence, and increase physical activity participation and encourage active behavior (Vansteenkiste et al. 2019, Springer et al. 2013, Deci and Ryan 2000). Therefore, there is a crucial and persistent need to motivate young adults to continuously participate in physical activity in order to promote healthy behaviors from young age to older age.

The Basic Psychological Needs Theory (BPNT, Deci and Ryan 2002) is a sub-theory within the self-determination theory (SDT) framework, which posits that the growth, integration, active lifestyle, and optimal functioning of humans are grounded in the satisfaction of three basic psychological needs: autonomy, competence, and relatedness. Autonomy refers to an individual's ability to make decisions in choosing and performing different tasks and behaviors (Vansteenkiste et al. 2020, Ryan and Deci 2017). Competence is the ability of an individual to master or efficiently relate to the environment and have confidence in achieving positive outcomes on assigned tasks. Lastly, relatedness reflects the extent to which an individual experiences interpersonal relationships, a sense of belonging in society, and connection with significant others (Vansteenkiste et al. 2020, Ryan and Deci 2017). When these three basic psychological needs are fulfilled, individual gains the impetus to maintain optimal well-being, adopt a healthy lifestyle, and experience a high level of happiness by engaging in physical activity (Junior et al. 2019, Ryan and Deci 2017). However, the inability to fulfill these three basic psychological needs may hinder the energy to grow, develop, and maintain healthy habits and resulting into physical inactivity.

Basic psychological needs have been shown to influence physical activity participation, exercise adherence, autonomous regulation toward CrossFit participation, and enjoyment in physical education indirectly enhancing physical health, life satisfaction, relieving stress, and reducing burnout (Gholidahaneh et al. 2020, Fraguela-Vale et al. 2020, Martinez et al. 2013, Kang et al. 2019, Teixeira et al. 2018, Rodrigues et al. 2018, Davies et al. 2016, Mefferd, 2021, Lovell et al. 2016, Matosic et al. 2016, Leisterer and Gramlich 2021). Additionally, a plethora of studies have demonstrated a positive relationship between the three basic psychological needs and physical activity behaviors (McDonough and Crocker 2007, Sánchez and Núñez 2007, Taylor et al. 2010, Peres et al. 2012, Erdogdu and

Öz 2021), enjoyment in physical education (Leisterer and Gramlich 2021), and sportsmanship (Cosma et al. 2021).

Physical activity participation has continued to decline globally, especially among young persons from late adolescence to older adults (Hallal et al. 2012). In Nigeria, the overall physical activity levels of young adults seem to be declining (Adeniyi et al. 2016) and not meeting the recommendation of engaging in at least 150–300 minutes of moderate-intensity PA (MPA) or 75–150 minutes of vigorous-intensity PA (VPA) per week for those aged 18 years or older (World Health Organization (WHO) 2020). Studies have shown that only 37% of young adults participated in 60 minutes of (MVPA) daily, with 59% involved at moderate levels, 3.8% involved in low levels, and 72% participated in PA at least once in a month (Odunaiya et al. 2010, Adeniyi et al. 2011, Senbanjo and Oshikoya 2010). This declining level of PA in the country and the world can be linked to recent technological advancements, modern lifestyles, automation of daily activities, motorization, urbanization, and unhealthy diets, which enhance sedentary lifestyles, unhealthy behaviors, and underline the necessity to address the growing malaise of physical inactivity (Knuth and Hallal 2009, Institute of Medicine 2013, Onyiriuka et al. 2016).

The transition of young adults from adolescence into adulthood that, from secondary school into university, is a stage encompassed with many challenges, including physical and mental health demands, academic stress and difficulties, a lack of time due to cumbersome lesson schedules and assignments, financial burdens, change in residence, and other school environment-related factors (Glascoe 2023, Ting 2009, Hiester et al. 2009, Oluyinka and Endozo 2019, Jaiyeoba 2018, Fawzy and Hamed 2017, Arnett 2000). These challenges affect young adults' overall well-being and behaviors. While the university environment offers substantial opportunities for all-round development and healthy lifestyles for young adults (Niedermeier et al. 2018), there is also a menace of reduced PA participation and increased sedentary lifestyles (Kann et al. 2018, Nelson et al. 2007), making university students vulnerable to many illnesses such as mental health issues, cardiovascular disease, cancer, osteoporosis later in life, overweight and obesity, tiredness, and exhaustion (McMahon et al. 2017, Fawzy and Hamed 2017, Bonevski et al. 2013, Sandu et al. 2018).

Research evidence suggests that gender differences exist and affects participation in physical activities, with males' involvement greater than females in most studies, with males having higher participation records in moderate to vigorous physical activities (Towne et al. 2017, Beltrán et al. 2017, Fraguela-Vale et al. 2020, Ugwueze and Agbaje 2022). Few studies have indicated no gender difference in PA participation (Manzano-Sánchez and Valero-Valenzuela 2018). Studies have shown that fulfilling BPNs increases individuals' impetus to engage in PA with greater commitment and determination, which in turn promotes overall well-being and active lifestyles in various countries (Fraguela-Vale et al. 2020, Gholidahaneh et al. 2020). While most of the studies on PA in Nigeria have focused on sociodemographic, personal, physical, psychological, and environmental factors that influence and associate with PA among different populations, especially among adolescents (Oluwasanu and Oladepo 2017, Oguntuase et al.

2021, Adeniyi et al. 2016, Adeniyi et al. 2011, Ugwueze et al. 2021, Oyeyemi et al. 2016), there is no evidence of a study on BPNs predicting PA participation among young adults in Nigeria. Therefore, this study investigates basic psychological needs predicting physical activity participation among young adults in Nigeria. The current study aims to: (1) examine the relationship between BPNs and PA among young adults in Nigeria, (2) examine whether BPNs would predict PA, and (3) examine whether BPN components would relatively predict PA.

Methods

Participants

A total of 735 university students, comprising 408 males (55.5%) and 327 females (44.5%), whose ages ranged from 16 to 35 years (mean = 22.8; SD = 5.42), were randomly selected from a private university in the South-west, Nigeria. These participants represented various departments across different faculties within the university spanning from 100 Level to 500 Level students. It's worth noting that all participants were registered full-time undergraduate students of the university. Exclusions from the study were made for students with physical or mental (learning) disabilities and those taking medications that limited their participation in physical activity.

Measures

The measures completed by the participants include:

Basic Psychological Needs

The English version (Vlachopoulos et al. 2011) of the Basic Psychological Needs in Exercise Scale (BPNES) (Vlachopoulos and Michailidou 2006) was utilized to assess the extent to which participants' fulfilled the basic psychological needs for autonomy, competence, and relatedness in their physical activity participation. The BPNES consists of 11 – items divided into three subscales: autonomy (4 items, e.g., "The way I exercise is in agreement with my choices and interests"), competence (4 items, e.g., "I am able to meet the requirements of my exercise program"), and relatedness (3 items, e.g., "My relationships with the people I exercise with are very friendly"). Participants rated the BPNES items on a 5 - point Likert-type scale (1 = strongly disagree to 5 = strongly agree). The Cronbach alpha coefficients obtained in this study for the three subscales of BPN were 0.78 for autonomy, 0.73 for competence, and 0.84 for relatedness.

Physical Activity (PA) Participation

The participants' physical activity levels were assessed using the International Physical Activity Questionnaire–Short Form (IPAQ-SF). This self-reported questionnaire measures the duration of various levels of physical activity over the past seven days or one week. The short form of the questionnaire is organized by dimensions and is structured to capture physical activity in four primary domains: vigorous, moderate, low (walking), and sedentary (sitting). The questions inquire about an individual's physical activity participation in the preceding seven days. The total weekly physical activity level is quantified as metabolic equivalent of task (MET) per hour per week, and it is categorized as high (≥ 3,000 MET-min/week), moderate (600 to 3,000 MET -min/week), or low (less than 600 MET-min/week), serving as an indicator for physical activity, (Craig et al. 2003, WHO 2010). The IPAQ-SF has been validated in a previous Nigerian study (Oyeyemi et al. 2013). In the current study, the Cronbach alpha coefficient for the IPAQ-SF scale was 0.81.

Procedure

Various departments across different faculties were approached to seek permission to access students for the study. The leaders of the students from each level and department were briefed about the research. Participants were randomly selected either as they entered the lecture rooms before the classes or when classes were in progress. Some classes responded after the lectures had started once their consent was obtained. The participants completed self-administered questionnaires. The questionnaire took approximately 10-15 minutes to complete. Participants were assured of the confidential treatment of the collected data. Students from the Department of Physical and Health Education (PHE) at the university were excluded from the study due to their regular participation in various physical activities, exercises, sports, and games. The study achieved a 95.6% completion rate, with735 out of 769 participants (100%) providing complete responses. Only 34 participants (4.4%) did not provide complete information.

Data Analysis

Data analysis was carried out using descriptive statistics, including frequency counts, percentages, means, and standard deviations. Inferential analysis involved correlation analysis to ascertain the relationship between the dimensions of basic psychological need and physical activity participation, t-test analysis was employed to assess gender differences in levels of physical activity participation, and multiple regression analysis was performed to determine the predictive capability of basic psychological needs and its individual dimensions on physical activity participation.

Results

Descriptive Statistics and Correlation Matrix

Table 1 displays the positive correlations between basic psychological needs of autonomy (r=0.233), competence (r=0.188), and relatedness (r=0.477) with PA participation. This suggests that an increase or enhancement in autonomy, competence, and relatedness would positively influence the physical activity participation among the participants. However, it's important to note that the correlation coefficients for autonomy, competence, and relatedness were relatively weak.

Additionally, the results presented in Table 2 indicate that 25% of the participants had low, levels of physical activity participation, while 57.1% had moderate levels, and 17.8% had high levels. There was significant gender difference levels of participation in physical activity ($t = 2.866$, $p < 0.05$) with males reporting a higher mean score (15.99) compared to their female counterparts, who had mean score of (14.83).

Table 1. *Correlation Matrix, Mean and Standard Deviation of Basic Psychological Needs and Physical Activity Participation*

	Variables Mean	SD	PA participation	Autonomy	Competence	Relatedness
Participation	15.47	5.51	1			
Autonomy	23.46	4.68	0.233**	1		
Competence	21.42	5.18	0.188**	0.365**	1	
Relatedness	23.00	4.94	0.477**	0.387**	0.467**	1
N=735 Sig.(2-tailed): **Autonomy=0.000** **Competence=0.000** **Relatedness=0.000**						

***Correlation is significant at 0.05 alpha level (p<0.05)*

Table 2. *Levels of Physical Activity Participation*

Levels of Participation	n	%
Low	184	25.0
Moderate	420	57.1
High	131	17.8
Total	735	100.0

Table 3. *Summary of t-test Analysis on Gender Difference in Physical Activity Participation*

	Gender	N	Mean	Std. Dev.	t	df	*P*
Physical activity participation	Male	408	15.99	5.98	2.866	733	0.004
	Female	327	14.83	4.80			

Table 4. *Results of Regression on Joint Prediction of Basic Psychological Needs on Physical Activity Participation*

R=.483 R^2=.233 Adj. R^2=.230 Std. Error=4.83793					
Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	5193.762	3	1731.254	73.968	0.000
Residual	17109.471	731	23.406		
Total	22303.233	734			

As shown in Table 4, it was observed that the linear combination of basic psychological needs (autonomy, competence, and relatedness) had a significant impact on physical activity participation among young adults ($F(3,731)=73.968$, $p < 0.05$). The results yielded a multiple regression coefficient of $R=0.483$ and a multiple R^2 of 0.233. Furthermore, the adjusted R^2 was calculated to be 0.230; indicating that approximately 23.0% of the variance was explained by the independent variables. This implies that, there was a significant collective predictive effect of basic psychological needs including autonomy, competence, and relatedness, on physical activity participation among young adults.

Table 5. *Results of Regression on Relative Prediction of Basic Psychological Needs on Physical Activity Participation*

Variables	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	2.661	1.085		2.452	0.014
Autonomy	0.084	0.042	0.071	1.970	0.049
Competence	-0.066	0.040	-0.062	-1.643	0.101
Relatedness	0.533	0.042	0.478	12.589	0.000

Table 5 displays information on autonomy, competence, and relatedness, including the unstandardized regression weight (ß), the standardized error of estimate (SEE), the standardized coefficient, the t-ratio, and the significance level of the t-ratio. As indicated in Table 5, autonomy (ß=0.071, t=1.970, $p < 0.05$) and relatedness (ß = 0.478, t=12.589, $p < 0.05$) were found to be independently significant predictors of physical activity participation among young adults. However, competence (ß=-0.062, t=-1.643, $p<0.05$) did not emerge as a significant predictor. This indicates that autonomy and relatedness were significant relative predictors of physical activity participation among young adults, while competence was not.

Discussion

The present study investigated the prediction of physical activity participation among young adults based on their basic psychological needs. Additionally, the

study examined the relationship between these BPNs and physical activity participation. The results revealed a positive correlation between the components of basic psychological needs and physical activity participation. This finding aligns with previous research (McDonough and Crocker 2007, Taylor et al. 2010). Leisterer and Gramlich (2021) also found that the three components of basic psychological needs were associated with enjoyment in physical education. Regarding gender differences, this study finding are consistent with Towne et al. (2017), indicating that male college students engage more in moderate-to-vigorous physical activity than their female counterparts, who tend to be more involved in heavy sedentary technology use activities, primarily driven by smartphone use. Similarly, Ugwueze and Agbaje (2022) found that boys more likely to meet the total physical activity requirements recommended by the WHO compared to their female peers. Fraguela-Vale et al. (2020) suggested that young girls prefer non-structured types of physical activity, while boys prefer organized forms.

Furthermore, the study demonstrated that BPNs predict physical activity participation among young adults, highlighting the importance of satisfying these needs for healthy growth, development, and well-being (Vansteenkiste et al. 2020, Ryan and Deci 2017). According to self-determination theory, fulfilling BPNs including autonomy, competence, and relatedness is crucial in motivating and encouraging young adults to engage in regular physical activity, promoting desired healthy behaviors (Fraguela-Vale et al. 2020). Kang et al. (2019) also found that these three BPNs components were significant predictors of exercise adherence among recreational sports participants, while Junior et al. (2019) indicated that BPNs contribute to physical development, functional level, and happiness in competitive games among futsal players. The study's results align with Leisterer and Gramlich (2021), who found that autonomy, competence, and relatedness increased students' enjoyment in physical education class, particularly among lower grades

In addition, the study revealed that both autonomy and relatedness were significant predictors of physical activity, with relatedness being the most potent factor. This finding corresponds with Davies et al. (2016), who reported that autonomy and relatedness within BPNs were significant predictors of autonomous participation in CrossFit. Relatedness plays a unique role in physical activity participation as individuals require the presence and involvement of significant others to meet the WHO's physical activity requirements for young adults. The need for relatedness is associated with a sense of belonging and acceptance by others, contributing to overall well-being within the community (Sánchez and Núñez 2007). It serves as a significant motivator for young adults to engage in regular physical activity (Peres et al. 2012). Quality friendship and relatedness were found to be associated with greater enthusiasm for participation in physical activity among adolescent girls (Gholidahaneh et al. 2020). Additionally, the need for relatedness significantly predicted respect for social conventions and opponent's elements of sportsmanship (Cosma et al. 2021).

Regarding the autonomy component of BPNs, the results are consistent with Kang et al. (2019), who reported that autonomy had a stronger impact on predicting longer-term exercise participation and exercise adherence compared to

the relatedness component of BPNs. Individuals with a strong sense of autonomy within BPNs were more likely to adhere to and maintain continuous participation in physical exercise. Similarly, Leisterer and Gramlich (2021) found a moderate to strong association between autonomy and enjoyment in physical education students. They suggested that changes in autonomy support may also impact competence and relatedness in physical education students. Additionally, Fraguela-Vale et al. (2020) noted that the fulfillment of autonomy within BPNs was significantly associated with engagement in unstructured activities in a first-year higher secondary education class.

Overall, these findings underscore the importance of addressing and satisfying basic psychological needs, especially relatedness and autonomy, to promote and sustain physical activity participation among young adults.

Limitations

This study has several limitations. Firstly, it utilized a cross-sectional design which does not allow for the establishment of causal relationships between basic psychological needs and physical activity participation variables. Consequently, the generalizability of the study's findings may be limited. Future research could employ intervention or longitudinal studies to investigate how fulfilling basic psychological needs can positively impact physical activity participation among young adults.

Secondly, data collection took place during the first three weeks of the second semester of the 2021/2022 academic session. This timing might have influenced the study's results, as students may have been particularly motivated to engage in physical activity, make new friends, and establish a sense of belonging by participating in both structured and unstructured activities at the beginning of the school year.

Thirdly, physical activity participation was assessed using self-report questionnaires, which rely on subjective data. This subjectivity limits the conclusions that can be drawn from the research, as they are based on participants' own opinions and perceptions. Future studies could consider incorporating objective measures, such as pedometers and accelerometers, to provide a more and objective assessment of energy expenditure in alignment with the physical activity recommendations outlined by the World Health Organization for young adults.

Conclusion

The present study revealed that the level of participation in physical activity was moderate among young adults in the university. There was a significant gender difference in physical activity participation among young adults, with males' involvement being higher than that of their female counterparts. The findings demonstrated a significant association between Basic Psychological Needs (BPNs) and physical activity participation. Furthermore, BPNs were found

to predict physical activity participation among young adults. Specifically, the study suggested that both relatedness and autonomy play a principal role in predicting physical activity participation.

This study provides valuable insights into the theoretical framework of BPNs (Deci and Ryan 2002), highlighting that the satisfaction of basic psychological needs may serve as a promising motivator for increased participation in physical activity among young adults. These findings are particularly relevant for professionals in the fields of exercise science and public health including sport and exercise psychologists, exercise physiologists, physical educators, health educators, school counselors, and university authorities. It underscores the importance of developing interventions that promote physical activity participation and enhance the overall well-being of university students.

Acknowledgments

The authors would like to express their gratitude to the authorities of the private university that facilitated this study, as well as the various Heads of departments, lecturers, students' course leaders, and the students who actively participated in the research. Your cooperation and support were greatly appreciated.

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