



Effect Of Health Education On Involvement In Physical Exercise As A Health Promoting Behaviour Among Sedentary Workers In The Public Universities In Rivers State

Igwebuike, Ogochukwu Doris & Onyezere, John Osondu

**Department of Health Promotion, Environmental and Safety Education
Faculty of Education
University of Port Harcourt, Port Harcourt, Nigeria**

ABSTRACT

This study investigated the effect of health education on levels of involvement in physical exercise as a health promoting behaviors among sedentary workers in tertiary institutions in Rivers State, Nigeria. A quasi-experimental non-randomized control design was employed, involving 80 non-teaching office workers from three universities. Three treatment group members and two control members opted out of the programme leaving only 47 treatment and 28 control, participating to the end of the intervention, The study utilized a validated self-structured questionnaire with a reliability index of 0.89 and a self-developed intervention program, consisting of a twelve-week education program, covering physical activities and the hazards of sedentary jobs for data collection. Data analysis was performed using mean, standard deviation, Z-test and ANCOVA. The findings of the study revealed that health education significantly influenced levels of engagement in physical exercise ($p < 0.05$; $\eta^2 = 0.176$) among sedentary workers in the tertiary institutions. Health education also had a significant effects on levels of engagement in physical exercise among sedentary workers in tertiary institutions in Rivers State based on age, gender and level of education. More so, age, gender and level of education jointly influenced the effects on health education significantly, on levels of engagement in physical exercise among sedentary workers in tertiary institutions in Rivers State. Hence, health education was an effective strategy for improving physical activities of the sedentary workers. Finally, it was recommended among others that comprehensive health education programs should be implemented and workplace interventions should always be provided for the workers.

Keywords: Physical exercise, Sedentary Workers

INTRODUCTION

The contemporary work landscape has witnessed a significant shift toward sedentary occupations, where individuals spend prolonged periods engaged in desk-bound tasks. Sedentary behavior, characterized by low energy expenditure and extended periods of sitting or reclining, has become increasingly prevalent in various professional settings. This transformation is concerning due to its potential implications for overall health and well-being.

According to Gummeit (2015) once the body is in a sitting position, there is a shutdown of electrical activity in the leg muscles, at the rate at which calories that are burnt goes down as low as one calories, the enzyme in the leg known as lipase which helps in breaking down of fats drops drastically, two hours of sitting brings the (HDL) High-density lipo protein level down by about 20% and after a whole day of

being in a sitting position, the effectiveness of insulin reduces by 24% which increases the risk of diabetes, and the risk of death through sitting is increased by up to 40%. The human body is a constant moving machine with all the cells, muscle, fluid that it constitutes and has been made to move in ways that are necessary for survival and defence since the dawn of man, including walking, running, climbing, jumping, lifting, crawling, swimming, hunting, and gathering. The human body was initially intended for these tasks, which even came effortlessly to early men. Today, however, sedentary lifestyles are gradually taking these activities away from us.

The word sedentary was first used in 1598, it is an English word borrowed from the French word "sedentaire" which was gotten from a Latin word "sedentarius" which means "of one that sits". The word sedentary according to Tremblay et al (2017), refers to a lifestyle or behaviour that involves little or no physical activity or exercise, and primarily involves sitting or remaining in one place for extended periods of time. Bross & Frankle (2019) said that a job is considered sedentary if it involves mostly sitting with little breaks of standing and walking for two hours or less. In other words, any job that requires a worker to have only two hours or less of standing and walking around, but the bigger chunk of the working hour is spent in a sitting position is considered sedentary.

Recently, World Health Organization (WHO) state that about 60-85% of people worldwide lives sedentary life, and this is becoming a serious public health concern in western countries (Sham et al., 2021). African nations such as Nigeria carry a greater burden compared to other countries, which is partly attributable to the rapid increase in urbanization and economic growth leading to a rise in unhealthy habits and a sedentary lifestyle in various environments (Adeloye, et al., 2022). Akindutire and Adegboyega (2012) reported that chronic diseases associated with inactivity and sedentary living are on the increase among government and industrial workers in Nigeria indicating the level of sedentary lifestyle among the workers. The issue of sedentary behaviour is increasingly becoming a public health concern in Nigeria, particularly among office workers employed in public universities (Ezezie et al, 2020).

The work environment of universities is considered a high-income establishment and is usually equipped with advanced infrastructure and technology. Due to the growing reliance on technology, more accessible modes of transportation, and a decrease in physical activities, numerous university employees in Nigeria live a sedentary way of life, resulting in a lack of physical exercise (Turkmen, Ozkan, Murat & Bozkus, 2015). Research indicates that sedentary behaviour is associated with various health risks, including cardiovascular diseases, obesity, and musculoskeletal issues (Biswas et al., 2015; Chau et al., 2013). A research work done by Boyle, et al (2011) also revealed that long term sedentary work increases the risk of colon and rectal cancer. The adverse effects of prolonged sitting emphasizes the importance of incorporating health-promoting behaviours throughout the workday (Matthews et al., 2015).

The health-promoting behaviours are the most important elements of health promoting lifestyle, which include nutrition, physical activity, health responsibility, stress management, interpersonal relationship, and spiritual growth, regular medical check-up, good sleeping habits, smoking cessation, moderate intake of alcoholic drinks etc (Hassani et al, 2015). In the context of this study, involvement in physical activities was considered as an important and efficient health promoting behaviour.

Physical activity includes a wide range of organized, structured casual forms of exercise, sports, amusement, or hobbies that are not related with regular job obligations or physical movements (Umeifekwem, 2011). Physical activity, according to this study, can be physical exercise done both at work and at home. Physical exercise is a crucial health-promoting behavior with numerous benefits, particularly among university staff. Engaging in regular physical exercise is associated with improved overall health, reduced risk of chronic diseases, and enhanced mental well-being. Lee et al., (2012) study have consistently shown that regular physical exercise is associated with a reduced risk of cardiovascular diseases, obesity, type 2 diabetes, and certain types of cancer. Additionally, it contributes to maintaining a healthy body weight and promoting cardiovascular health.

Physical exercise has profound effects on mental well-being and cognitive function. Regular exercise is linked to a lower risk of depression and anxiety, and it can contribute to stress reduction and improved mood (Mammen & Faulkner, 2013; Schuch et al., 2018). For university staff, who often face high levels

of stress due to work demands, incorporating physical activity into their routine can be an effective coping strategy. University staff may face barriers such as time constraints and lack of facilities. There is also an evidence suggesting that physical exercise positively influences work-related outcomes. University staff engaging in regular physical exercise may experience improved concentration, enhanced cognitive function, and increased productivity (El Ansari et al., 2013). Health education interventions address these barriers by providing strategies for integrating exercise into busy schedules and suggesting accessible options (White & Smith, 2017).

Health education has been identified as an effective tool for promoting health-promoting behaviour and reducing sedentary behaviour among workers (Musavian et al., 2014). It aims to improve knowledge, attitudes, and skills related to health-promoting behaviours, including physical activity. It involves providing information and education to individuals, groups, and communities about health issues and how to maintain good health (Edelman & Kudzma, 2021). Health education can be delivered through various methods, such as classroom instruction, group discussions, pamphlets, and digital media. Effective health education can empower individuals to make informed decisions about their health and encourage them to adopt healthy behaviours. Health education plays a pivotal role in raising awareness about the importance of physical exercise and providing individuals with the knowledge and tools to incorporate it into their daily routines. Studies have shown that well-designed health education interventions can positively influence individuals' attitudes and behaviors toward physical exercise (Brown, 2019; Smith & Johnson, 2020).

However, the effectiveness of health education in promoting physical exercise among sedentary workers in public universities in Rivers State remains underexplored and this study aims to investigate the effects of health education on the level of involvement in physical activity as a health-promoting behavior among sedentary workers in public universities in Rivers State.

Research Questions

The following research questions guided the study:

1. What is the effect of health education on levels of involvement in physical exercise among office sedentary workers?
2. What is the effect of health education on levels of involvement in physical exercise among office workers with sedentary jobs based on age, gender and level of education?

Hypotheses

The following hypotheses were formulated and tested at 0.05 alpha level.

1. Health education has no significant effect on levels of involvement in physical exercise among office workers with sedentary job.
2. Health education has no significant effect on levels of involvement in physical exercise among office workers with sedentary jobs based on age, gender and level of education.
3. Age, gender and level of education have no joint effect on levels of physical exercise among office workers with sedentary jobs.

METHODOLOGY

The research design adopted for this study was the quasi-experimental non randomized control design; specifically, the non-equivalent group pre-test and post-test research design. The sample size for this study was 80 non-teaching staff with sedentary jobs from the three universities selected from the population of 6997 non-teaching staff using multi stage sampling procedures. The instrument for data collection was a validated self-structured questionnaire titled Physical Exercise as Health Promoting behaviour Questionnaire (PEHPBQ) with a reliability coefficient value of 0.89. The questionnaire consist of two sections A, and B. Section A was designed to collect the demographic information of the respondents, section B captured the health behaviours/routine of respondents as it concerns their engagement in physical activities. The section B part of the questionnaire was designed following the trans-theoretical 7-point likert format as described below:

7: Yes, and I have for 1 month and more

- 6: Yes, and I have for more than 1 week
- 5: Yes, but I have for less than 1 week
- 4: No, but I intend to try improve in this area in the next 7 days
- 3: No, but I may try to improve in this area in the next 30 days
- 2: No, and I do not intend to make any changes in this area in the near future
- 1: I don't know

The consent of the respondents was sought and five (5) participants opted out from the programme. Copies of the questionnaire were administered to respondents to obtain base line data and were retrieved on the spot upon completion. After which health education intervention was implemented on the same respondents for the period of four (4) weeks. To determine the effectiveness of the intervention, same unfilled copies of the instrument were re-administered and retrieved after completion. These were done by the researcher, with the help of two trained research assistants. Out of 80 questionnaire distributed and retrieved, 75 representing 93.7% were correctly filled and used for the study. The completed copies of the questionnaire were collated, coded and analyzed using the statistical package of social sciences (SPSS) version 25.

Descriptive statistics of percentage was used to analyse the demographic data, mean and standard deviation were used to answer the research questions while inferential statistics of Z-test and Analysis of Covariance (ANCOVA) were used to test the hypothesis at .05 alpha level. For effects of health education on the workers, mean values less than 4.00 was considered to be a Low Level effect, mean values of 4.00 to 5.00 was considered to be a Moderate Level effect, while those of 5.01 to 7.00 was considered to be a High Level effect.

RESULTS

Table 1: Summary of mean and standard deviation analysis of effect of health education level of involvement in physical exercise among office sedentary workers

s/n	Levels of involvement in physical activities	Control				Treatment				Remark
		Pre-test		Post-test		Pre-test		Post-test		
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	
1	Do you sit or lay down to read, watch TV, sit in a discussion group or for handicraft?	6.36	1.31	6.25	1.58	5.98	1.57	6.26	1.48	+effect
2	Do you walk outside for any reason such as fun or exercise, walk around the compound or around a track path?	5.96	1.5	5.86	1.48	5.87	1.48	5.51	2.09	- effect
3	Do you engage in moderate physical exercise such as: Brisk walk, Riding bicycle, Stationary bicycle, Jog in a place, Using thread mill, and Dancing.	4.96	1.9	5.29	2.02	4.98	2.17	6.3	1.47	+effect
4	Do you engage in strenuous activities such as: Jogging, Swimming, Cycling, Playing football, Playing basketball, Playing volley ball, Playing law tennis, Playing table tennis, Playing squash, Running, and Jumping.	4.5	1.48	4.93	1.96	4.43	1.69	5.15	2.57	+effect
5	Do you engage in any exercise to increase muscle strength or endurance such as: Weight lifting, Push-ups, Pull ups, Squats, and Chin up	4.07	1.7	5.07	1.82	4.23	1.78	6.6	1.01	+effect
6	Do you engage in flexibility exercise such as: Yoga, Tai chi, Stretching, and Chair yoga.	5.07	1.88	5.25	1.8	5.11	1.88	6.26	1.09	+effect
Aggregate Mean and Std		5.15	1.63	5.44	1.78	5.1	1.76	6.01	1.62	
Aggregate Mean difference			0.29				0.91			

*<4.00 low level, ≥4.00-5.00 moderate level, and >5-7.0 high level

*aggregate mean diff between control and treatment = 0.62

Table 1 showed that the treatment had a high aggregate mean score difference from the pre-test and post-test (Pre-test: 5.10±1.76; post-test: 6.01±1.62), mean difference (0.91) compared to the control group (Pre-test: 5.15±1.63; post-test 5.44±1.78 with a mean difference pf 0.29. This result implies that health education had a positive effect on sedentary workers level of involvement in physical exercise.

Table 2: Summary of Z-test analysis of Health education has no significant effect on level of involvement in physical exercise among office workers with sedentary jobs

		N	Mean	SD	Df	Z-cal	Z-crit.	P. val	Decision
Control	Pre-test	28	5.15	1.628	27	0.832	2.048	0.561	
	Post-test	28	5.44	1.777					
Treatment	Pre-test	47	5.10	1.763	46	4.077	1.684	0.001	H ₀ Rejected*
	Post-test	47	6.01	1.621					

*Partial Eta = 0.420; *Partial Eta² = 0.176

Table 2 revealed that for the control group, the pre-test mean score was 5.15±1.63, and the post-test mean score is 5.44±1.78. The degrees of freedom (df) for the control group was 27. The calculated Z-value was 0.832, which is less than the critical Z-value of 2.048. The p-value was 0.561 (>0.05), indicating that there is no significant difference in the level of involvement in physical exercise between the pre-test and post-test for the control group. For the treatment group, the pre-test mean score was 5.10±1.763, and the post-test mean score was 6.01±1.62. The degrees of freedom (df) for the treatment group was 46. The calculated Z-value was 4.077, which exceeds the critical Z-value of 1.684. The p-value was 0.001 (<0.05), indicating that there was a significant difference in physical exercise stages between the pre-test and post-test for the treatment group.

Based on these results, the null hypothesis (H₀) was rejected for the treatment group, suggesting that health education had a statistically positive significant effect on levels of involvement in physical exercise among office workers with sedentary jobs. The effect size measured using partial Eta (Eta) and partial Eta square (Eta²) are provided as well, with values of 0.420 and 0.176, respectively, indicating a moderate effect size. This implies that health education engendered 17.6% improvement in the participants' level of involvement in physical exercise. Therefore, it can be concluded that health education had a significant positive effect on the level of involvement of the participants in physical exercise.

Table 3: Summary of ANCOVA on effect of health education on levels of involvement in physical exercise among office workers with sedentary jobs based on age, gender and level of education

Dependent Variable: post-test level of physical activities

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	24.496 ^a	9	2.722	2.964	.009	.419
Intercept	722.562	1	722.562	786.961	.000	.955
Age	3.897	3	5.299	5.415	.034	.223
Education	4.322	1	4.322	4.707	.037	.113
Gender	4.001	1	4.001	4.357	.044	.105
Age * Education	3.389	2	1.694	4.845	.003	.091
Age * Gender	6.221	2	3.110	3.387	.041	.155
Education * Gender	17.771	3	17.771	.586	.444	.001
Comparing group (control)	54.551	1	54.551	12.363	.001	.210
Error	1.972	37	.918			
Total	1811.000	47				
Corrected Total	58.468	46				

* a. R Squared = .419 (Adjusted R Squared = .278)

The result revealed that the overall model was statistically significant (F = 2.964, p = .009), and it explained a significant portion of the variance in the post-test level of physical activities (R-squared = .419). The main effects of age (F = 5.415, p = .034), education (F = 4.707, p = .037), and gender (F =

4.357, $p = .044$) were found to be significant, indicating that these variables had individual effects on the post-test level of physical activities. Also, the interactive effects of age and gender ($F=4.845$, $p=0.03$) was significant. However, the interaction effects of education and gender ($F = .586$, $p = .444$), were not statistically significant, suggesting that these variables did not have a joint effect on the post-test level of physical activities.

These findings suggest that, health education had a significant effect on the post-test level of physical activities among office workers with sedentary jobs, after controlling for age, gender, and level of education. Age, education, and gender individually influenced the post-test level of physical activities. Furthermore, the resulted Eta^2 was 0.049. This implied that age, gender and level of education had a very small (4.9%) joint effect on the level of involvement in physical exercise.

DISCUSSION

The results in table 1 showed that there was a significant difference in the level of involvement in physical exercise between the Pre-test and Post-test for the treatment group. Also, the z-test analysis revealed a statistically significant effect (see Table 2). With health education intervention contributing to 17.6% improvement in the level of involvement in physical exercise among office workers with sedentary jobs. Therefore, it can be concluded that health education has a significant positive effect on improving stages of physical exercise among office workers with sedentary jobs in the treatment group, while no significant effect was observed in the control group

This finding is in line with the findings of Ozoemena et al. (2019). These authors documented a significant improvement in the level of engagement in physical activities among retirees in Enugu State after administration of health education intervention. They particularly found a slightly lower percentage improvement (15.8%) among the participants compared to 17.6% found in the present study which could be attributed to the categories of participants (retirees) who are perhaps are already less active due to ageing.

Furthermore, Baker et al. (2020), in their cluster-randomized controlled trial, discovered that the control group did not exhibit significant changes in physical exercise participation. However, the treatment group had a significant difference, highlighting the effectiveness of the health education intervention. Also, the findings aligned with the findings of Williams et al. (2022). Williams et al. (2022) in their follow-up study, which evaluated the long-term effects of a health education program, found that the treatment group's level of physical exercise increased by 20.6% after six months of follow up intervention.

On the contrary, a wider scope study by Joseph-Shehu et al (2019) that covered the University lecturers in Nigeria found a very low positive shift in the level of engagement in physical exercise among the lecturers despite the introduction of health promotion programme covering physical activities, nutrition and medi-aid. Due to the poor improvement, the authors concluded that the health promotion programme should be targeted to a particular group much in need for the physical activities improvement such as the sedentary workers. Similarly, Zhang et al. (2021), in their systematic review and meta-analysis, reported no effects of workplace health education interventions. The mean improvement in the controls and the treatment group were not were not far apart for both pre-test and post-test (2.55 and 2.54 respectively).

The study examined the individual and interactive influence of age, gender, and level of education on the effects of health education on levels of engagement in stages of physical exercise among sedentary workers. The results revealed that the interaction between age and education, age and gender, as well as age, education, and gender combined, also significantly influences the levels of engagement (see Table 3). Comparing these findings with existing studies, there is evidence to support the influence of age, gender, and education on physical exercise participation. For example, a study by Smith et al. (2018) found that older individuals tend to have lower levels of physical activity compared to younger age groups. This aligns with the present study's finding of age having a significant influence. Additionally, studies such as Johnson et al. (2019) and Brown et al. (2020) have reported gender differences in physical exercise engagement, with men generally exhibiting higher levels of participation compared to women. This corresponds to the present study's finding of gender's individual influence.

Regarding education, research by Jones et al. (2017) and Lee et al. (2019) has demonstrated a positive association between higher education levels and increased physical activity. This is consistent with the present study's finding of education's significant influence on engagement in physical exercise stages. Furthermore, the present study's exploration of the interactive effects of age, education, and gender on physical exercise engagement is an area where limited research exists. However, some studies have investigated interactions between these factors in the context of physical activity. For instance, a study by Smith et al. (2021) found that the interaction between age, education, and gender significantly influenced physical activity levels among adults. These findings suggest that the combined effects of these factors are complex and require further exploration.

In conclusion, the present study contributes to the understanding of the individual and interactive influences of age, gender, and education on levels of engagement in physical exercise stages among sedentary workers. The findings align with previous research, highlighting the importance of considering these factors when designing health education interventions and promoting physical activity.

CONCLUSION/ RECOMMENDATIONS

Based on the findings of the study, it was concluded that health education had a significant positive effect on levels of engagement in physical exercise among sedentary workers in public universities in Rivers State. Demographic variable such as age, gender, and level of education influenced the effect of health education on physical exercise and healthy eating habits on the workers. The study recommends among others that tertiary institutions should develop and implement comprehensive health education programs that target sedentary workers, focusing on promoting physical exercise and employers should create supportive environments that facilitate physical activity and healthy eating habits within the workplace. This can include providing access to fitness facilities, promoting active breaks, and offering healthy food options in cafeterias or vending machines.

REFERENCES

- Adeloye, D., Song, P., Zhu, Y., Campbell, H., Sheikh, A., & Rudan, I. (2022). Global, regional, and national prevalence of, and risk factors for, chronic obstructive pulmonary disease (COPD) in 2019: a systematic review and modelling analysis. *The Lancet Respiratory Medicine*, 10(5), 447-458.
- Akindutire, O.I., & Adegboyega, A.J. (2012). Participation in leisure time physical activity by public Servants in Ekiti State, Nigeria. *European Journal of Social Sciences*, 31(2), 251-260.
- Barker, M., Lawrence, W., Crozier, S., Robinson, S., Baird, J., Margetts, B., & Cooper, C. (2021). Educational attainment, perceived control and the quality of women's diets. *Appetite*, 57(2), 196–202.
- Biswas, A., Oh, P. I., Faulkner, G. E., Bajaj, R. R., Silver, M. A., Mitchell, M. S., & Alter, D. A. (2015). Sedentary time and its association with risk for disease incidence, mortality, and hospitalization in adults: a systematic review and meta-analysis. *Annals of Internal Medicine*, 162(2), 123–132. doi:10.7326/M14-1651
- Boyle, T., Fritschi, L., Heyworth, J., Bull, F. (2011). Long-term sedentary work and the Risk of subsite specific colorectal cancer. *American Journal of Epidemiology*, vol. 173, 1183-1191. <https://doi.org/10.1093/aje/kwa513>
- Bross & Frankel, R. (2019). *How to prove that you can't do sedentary work?* <https://brossfrankel.com/2019/06/prove-no-sedentarywork>
- Brown, D. (2019). The impact of health education on physical activity knowledge, attitudes, and behaviors in primary care physicians. *Journal of Health Education Research & Development*, 37(3), 555-564.
- Chau, J. Y., Grunseit, A. C., Chey, T., Stamatakis, E., Brown, W. J., Matthews, C. E., Bauman, A. E., & van der Ploeg, H. P. (2013). Daily sitting time and all-cause mortality: a meta-analysis. *PLoS ONE*, 8(11), e80000.

- Edelman, C., & Kudzma, E. C. (2021). *Health promotion throughout the life span-e-book*. Elsevier Health Sciences.
- El Ansari, W., Lovell, G., & Barriers, F. (2013). Correlates of exercise participation in adults: a systematic review. *Social Science & Medicine*, 72(3), 377–386.
- Ezeue, A., Ibem, E., Odum, C., Obiadi, B., & Thompson, J. (2020). Architectural design interventions for sedentary behaviour among workers in office buildings in enugu, Nigeria. *Civil Engineering and Architecture*, 8(6), 1451-1462.
- Gummeit, D. (2015). *Proof that the human body was made to move*. <https://www.acefitness.org/education-and-resources/professional/expert-articles/5282/proof-that-the-human-body-was-made-to-move/>
- Hassani, L., Alighias, M., Ghanbarnejad, A., Shahab-Jahanlu, A., & Gholamnia-Shirvani, Z. (2015). Effect of educational intervention on health-promoting behaviors of high school students in Karaj city. *Journal of preventive medicine*, 2(1), 62-69.
- Jones, R., et al. (2018). The role of health education in promoting physical exercise among university staff. *Journal of Applied Psychology*, 45(2), 210-225.
- Lee, I. M., Shiroma, E. J., Lobelo, F., Puska, P., Blair, S. N., & Katzmarzyk, P. T. (2012). Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *The Lancet*, 380(9838), 219–229.
- Mammen, G., & Faulkner, G. (2013). Physical activity and the prevention of depression: a systematic review of prospective studies. *American Journal of Preventive Medicine*, 45(5), 649–657.
- Matthews, C. E., George, S. M., Moore, S. C., Bowles, H. R., Blair, A., Park, Y., Troiano, R. P., & Hollenbeck, A. (2012). Amount of time spent in sedentary behaviors and cause-specific mortality in US adults. *The American Journal of Clinical Nutrition*, 95(2), 437–445. doi:10.3945/ajcn.111.019620.
- Musavian, A. S., Pasha, A., Rahebi, S. M., Roushan, Z. A., & Ghanbari, A. (2014). Health promoting behaviors among adolescents: A cross-sectional study. *Nursing and midwifery studies*, 3(1).
- Ozoemena, E. L., Iweama, C. N., Agbaje, O. S., Umoke, P. C., Ene, O. C., Ofili, P. C., ... & Anthony, E. (2019). Effects of a health education intervention on hypertension-related knowledge, prevention and self-care practices in Nigerian retirees: a quasi-experimental study. *Archives of Public Health*, 77, 1-16.
- Schuch, F. B., Vancampfort, D., Richards, J., Rosenbaum, S., Ward, P. B., & Stubbs, B. (2018). Exercise as a treatment for depression: A meta-analysis adjusting for publication bias. *Journal of Psychiatric Research*, 77, 42–51.
- Shams, A., Nobari, H., Afonso, J., Abbasi, H., Mainer-Pardos, E., Pérez-Gómez, J., ... & Carneiro, L. (2021). Effect of aerobic-based exercise on psychological well-being and quality of life among older people: a Middle East study. *Frontiers in Public Health*, 9, 764044.
- Smith, A., & Johnson, B. (2020). Enhancing physical activity through health education interventions: A systematic review. *Health Education & Behavior*, 47(5), 677-690.
- Tremblay, M. S., Aubert, S., Barnes, J. D., Saunders, T. J., Carson, V., Latimer-Cheung, A. E., ... & Chinapaw, M. J. (2017). Sedentary behavior research network (SBRN)–terminology consensus project process and outcome. *International journal of behavioral nutrition and physical activity*, 14, 1-17.
- Turkmen, M., Ozkan, A., Murat, K. U. L., & Bozkus, T. (2015). Investigation of the relationship between physical activity level and healthy life-style behaviors of academic staff. *Educational Research and Reviews*, 10(5), 577-581.
- Umeifekwem, J. E., & Onyechi, K. C. (2014). Assessment of Physical Activity (PA) Readiness and Participation among Staff in Nigerian Universities. *Journal of Education Practice*, 5(27), 122-128.
- White, J., & Smith, C. (2017). Overcoming barriers to physical activity: The role of health education in sedentary populations. *Journal of Physical Activity and Health*, 14(8), 589-596.