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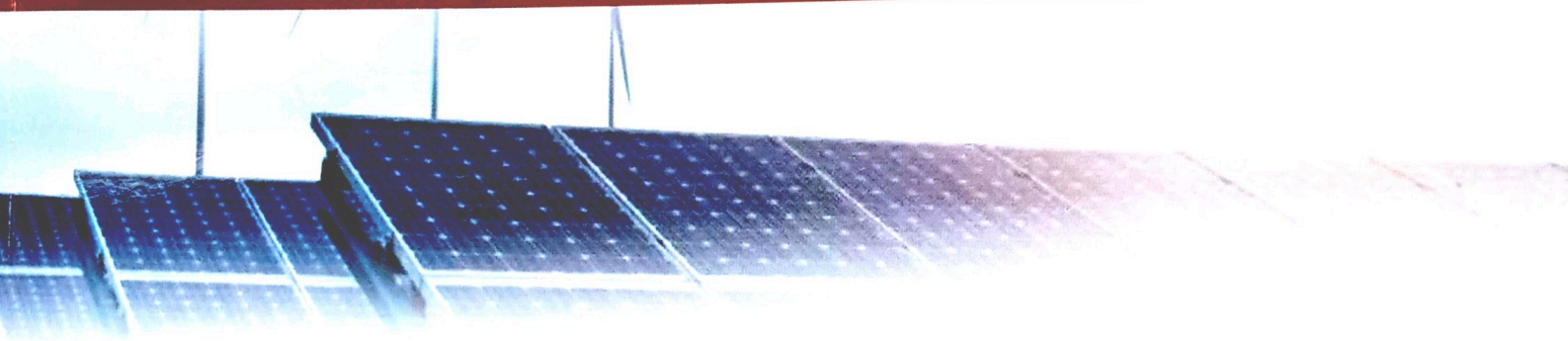

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Aim and Scope

The Environmental Technology and Science Journal (ETSJ) is devoted to the publication of papers which advance knowledge of practical and theoretical issues that daily plague our society. The aim of the journal is to provide an avenue for the dissemination of academic research findings from various disciplines of the environment, engineering, pure and applied sciences, arts and social science which have materials that emphasize on environmental issues.

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Editorial

The 2021 United Nations Climate Change Conference (COP26) that took place in Glasgow, Scotland from 31st October to 13th November has come and gone leaving the environment at the mercy of developed and developing nations. The global warming is still far from the 1.5°c benchmark set but countries such as Nigeria and India pledged net zero emissions by 2060 and 2070 respectively; ambitious? Time will tell, it is on this basis that I welcome our readers to Volume 12, number 2, December edition of Environmental Technology and Science Journal (ETSJ). There are 16 articles that cut across topical issues in the built environment. Happy reading!

Past and current editions of the Journal can be found at these web addresses: https://etsj.futminna.edu.ng and https://www.ajol.info/index.php/etsj (Yes, ETSJ on AJOL) for download at no cost.

Let us do it again, peace!

R. A. Jimoh
Managing Editor

Contents

classified into active or passive, organized or unstructured, inside, or outdoors, alone or in groups among others. Man's advantages from leisure activities cannot be overstated. This includes reduced social anxiety, lower social isolation, higher social self-concept, increased self-esteem, assists in the development of skills such as leadership, interaction, and communication and offers chances for socializing (Eime *et al*, 2013; Mokaya and Gitari, 2012; Oyerinde *et al*, 2014).

Reasons for participation or non-participation may include time, energy, ability to reach recreational places, fear of criminality, insufficient recreational areas, and poor recreational design elements in recreational facilities (Sava, 2015; Godbey, 2009). In general, social, psychological, economic, and environmental variables may influence whether people participate (Aslan, 2002; Abubakar, 2011). According to a prediction made by the World Health Organization in a discussion paper titled "Mental health, poverty, and development" published in 2009, depression will be the third leading cause of disease burden in low-income countries by 4.7 percent by 2030 and the second highest cause of disease in middle-income countries by 6.7 percent. Due to this, depression and other mental problems are not uncommon. Amongst the studies that emphasized the need for recreation in improving mental health is Lee *et al* (2018) who discussed that leisure activities may reduce the risk of depression in the elderly. Similarly, longitudinal, and cross-sectional studies showed a link between specific social activities, such as attending to the theater and reading magazines, and mental health condition in middle-aged and older people. Misconceptions about the causes of mental illness, on the other hand, have generated stigma and misconceptions about treatment options, leading many communities and people to believe that treatment outside of a hospital is impossible.

Recreation, according to many studies' is one of the potential methods to reduce mental illness and provide psychological and emotional balance in contemporary society. According to Zekiye (2016), recreation have a rising positive impact on inmates' self-esteem and a decreasing negative effect on their loneliness while Lackey *et al* (2019) claim that nature has a beneficial effect on mental health. The results show that nature-based leisure has a significant potential to improve mental outcomes such as well-being, cognition, resilience, and restoration, as well as lower levels of anxiety, depression, and stress. Other studies that support that re recreation is beneficial include (Lam *et al* 2017 and Bayazit, 2017). However, current research into the topic has shown that there is a dearth of this kind of research in the studied field. Most research conducted in the study area focused on other aspect of recreation asides its impact on mental health. This is seen in the work of (Bogoro, 2018; Ihuma, *et al* 2016; Enemuo & Obijuru, 2017) among others.

The study set out to answer the following questions considering the issue statement above: What are the nature and motives of recreational participation of participants in Abuja?

To what extent does duration and frequency of participation affect mental health of participants? Does effect of recreational participation vary among participants based on socio-demographics?

The study aimed at assessing the effect of recreational activities on mental health of participants in Abuja. Given the aim, the objectives are to;

(1) Examine the nature and motive of recreational participation of participants in Abuja
(2) Analyze the effect of duration and frequency of recreational participation on mental health.
(3) Determine the variation in effect of participation in recreational activities on the basis on socio-demographics of participants.

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CONCEPT OF MENTAL HEALTH

According to McKay (2012), mental health is "a positive concept that encompasses the inner individual experience as well as interpersonal group experience. To the individual, good mental health means happiness, competence, a sense of control over one's life, positive feelings of self-esteem, and capacities to love, work, and play." Furthermore, mental health is defined as "subjective well-being, perceived self-efficacy, autonomy, competence, intergenerational reliance and awareness of one's capacity to fulfill one's intellectual and emotional potential." (World Health Organization, 2003). Three (3) perceptions may be formed from the preceding viewpoints: (a) Mental health is more than the absence of mental disorders; (b) it entails pleasant emotions and (c) social, emotional, and psychological functioning. There are two types of mental health: positive and negative. Positive mental health is characterized by positive affect and positive personality characteristics, both of which are regarded resources. They have high self-esteem, a strong feeling of mastery, a strong sense of coherence (life is purposeful and controllable), and a strong sense of self-efficacy. (Kenneth, 2014). In terms of negative mental health or mental illness, the World Health Organization's fact sheets on the Sustainable Development Goal (SDG) explain mental disorders "As disturbances in a person's mental health, which are often characterized by a mix of troubled thoughts, emotions, behavior, and interpersonal relationships.

METHODOLOGY

This survey was conducted in Abuja to obtain the perception of recreational participants on impact of recreational activities on mental health. A total of 250questionnaires were administered using the purposive sampling. Since the population of a recreational site cannot be determined. Simple random sampling technique was employed for the administration of questionnaires. The questionnaire was administered in City Park, Wuse II Abuja and National stadium (package B), and were selected based on frequent visitation. There was consideration about the population to be interviewed and stratified sampling technique was adopted to cover only respondents from 18years and above, which constitute major group of people that visit the parks regularly. The questionnaire administered had three different sections which are thus: Socio-demographic and socio-economic characteristics of respondent, section two collected information on the nature and motivations for recreational activities and section three collected information on respondents' recreational participation duration and frequency trend. The other aspect of this section used the General health questionnaire (GHQ-12) to gather information on respondents' perception on the impact of the recreational activities on their mental health. Data was collected at weekend from the hours of 9am to 6pm because, these are one of the periods when visitation to recreational facilities is high due to work free days, people tends to relaxed more during the weekends. The statistical program for social scientists (SPSS) was used to compile and evaluate the data obtained via. A descriptive method was used with basic tables displaying frequencies and percentages. Pearson correlation coefficient and regression analysis are two statistically inferential techniques utilized. The study was helpful in determining the degree to which recreational involvement affects mental health in terms of frequency and length. Also, to see whether there is any difference in the effect that respondents have depending on their socio-demographics.

RESULTS AND DISCUSSION

Analysis of the result obtained from the study shows the perception of people on the impact of participation in recreational activities on mental health of participants in Abuja. 237 questionnaires were retrieved. There was high level of male respondents in

the study area. Male accounted for 53% while female accounted for 47% of the population sampled. This shows that men presented a higher participation level than women. However, the amount of variation is not so much. According to Basoglu (2013), men are more active than women recreational activities although this disparity depends on the type of recreational activities and the intensity of participation. The result from this study therefore supports the theory. The selection of respondents was limited to adults who are between the ages 18 and above. Most of the respondents were youths between the ages of 25-35years (39.2%). This was followed by respondents with ages between 18-25years (31.2%), the people within the ages of 35-45 years accounted for 18.1% while 6.3% and the remaining 5.1% of the respondents accounted for those that falls within the age bracket of 45-55 years and 55 years above respectively. This study is consistent with the study of Mcguirk (2012) who asserts participation in recreational activities particularly physical activities may decrease according to increase in age. The responses are shown in Figure 1

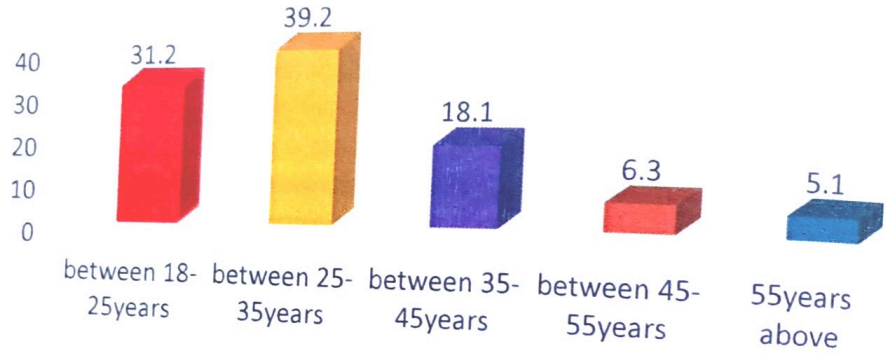

Figure 1: Age of the Respondents

The Occupational status of respondents also revealed that 45% of the respondents were self-employed while 24% of the respondents were students. Furthermore, 19% of the respondents were civil servants and the remaining 12% of the respondent's others such as artisans, coaches and those employed in private organizations. This implies that the self-employed and student population have more free time to participate in recreational activities because they have more control of their time than employees or artisans who have limited control of their time because of other obligation asides their personal obligations.

The level of income indicated that most of the respondent earn above the ₦30,000 minimum wage approved by the federal government. In other words, income is not a constraint towards participation as most respondent can afford expenses that may arise from recreational participation. This study therefore supports Arhadan and Mert (2014) who indicated that income amongst other socio-economic factor could have a positive effect on participation in outdoor recreational activities. In other words, when a person is financially stable, he can engage in recreational activities. This is shown in Figure 2 below

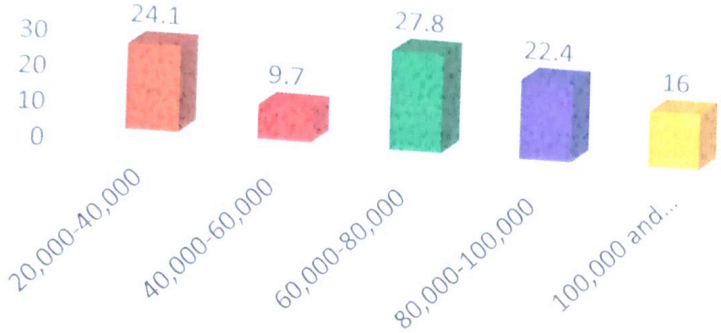

Figure 2: Monthly Income of the Respondents

The marital status of respondent revealed that 48% of the respondents were married while 45% of the respondents were single, and the remaining 7% of the respondents were widowed. This implies both single and married participate in sporting activities in the study area. Based on religion, respondents who are Christians showed a higher percentage by 80% and Muslims accounted for 16% of the respondents. The remaining 4% accounted for others that belongs other religion.

Nature and Motive for Participation of Residents

Nature of Recreational Activities

Table 1 shows the recreational activities the respondents engaged in. The findings show that majority of the respondents engage in swimming activities 56.1% while (41.4%) stated otherwise. Those that visited Cinema and other recreational activities identified in the questionnaire accounted for 34.2%, 31.2%, 21.1%, 27%, 16.9%, 20.3%, 28.7% and 41.4% respectively while those that stated otherwise accounted for 41.4% in total.

Table 1: Nature of Recreational Activities

Activities	Yes	No
Swimming	133(56.1%)	104(43.9%)
Visiting a cinema	81(34.2%)	156(65.8%)
Picnicking	74(31.2%)	163(68.8%)
Lawn tennis	50(21.1%)	187(78.9%)
Basketball	64(27%)	173(73%)
Astroturf	40(16.9%)	197(83.1%)
Paint-bailing	48(20.3%)	189(79.7%)
Aerobics	68(28.7%)	169(71.3%)
Others, please specify	98(41.4%)	139(58.65)

Reasons for Participation

It is expressed in Table 2 that, the reasons for participating in the activities which majority identified relaxation as reason for participation (54.2%) followed by to get away stressful situations (23.2%) and being bored and lonely (15.2%). Because it was recommended by a medical practitioner due to medical reasons accounted for 4.2% of the respondents sampled while the remaining 3.4 % accounted for others. This implies that most of the respondent reason for participation in recreational activities is health related reasons. As such, health factor particularly psychological health factor can be a determinant for participation in recreational activities (Abubakar, 2011).

Table 2 Reasons for participation

Reasons for participation	Frequency	Percent
To get away from stressful situations	55	23.2
because am bored and lonely	36	15.2
It helps me to relax	128	54.0
It was recommended by a medical practitioner due to medical reasons	10	4.2
Others	8	3.4
Total	237	100.0

Participation Duration and Frequency

Duration for Participation

It is evident in Table 3 time spent on recreational activities. The findings revealed that 46.0% of respondents spend between 30minutes-1hour, followed by 30.8% of the respondents who spend between 1hour-2hours. Those that spent between 2hours -3hours accounted 14.8% while those that spend less than 30minutes and 3hours and above accounted for 5.1% and 3.4% of the respondents respectively. This indicates that majority of the respondent spend at least 30minutes and at most 1-2 hours in recreational activities participation. This may be due to availability of other engagements asides recreational activities. Nevertheless, the duration for participation can be considered as a reasonable amount of time to participate in recreational activities. These findings therefore support the recommendation made by the Canadian Psychological Association (2016) as regards the duration for recreational participation.

Table 3 Duration of Participation

Duration	Frequency	Percent
Less than 30minutes	12	5.1
between 30minutes-1hour	109	46.0
between 1hour-2hours	73	30.8
between 2hours-3hours	35	14.8
3hours and above	8	3.4
Total	237	100.0

Frequency of Participation

As identified in table 4 respondents often participate in the identified recreational activities. Those that participated at least once a week especially on weekends accounted 40.9%, those that participated quarterly accounted for 26.7%, those that participated daily accounted for 18.1% while others (occasionally) accounted for 6.3%. This implies that respondent do not participate in recreational activities daily. As stated by the Canadian Psychological Association (2016), physical activity should be moderate; 30 minutes per day for five or more days per week and vigorous; 20 minutes per day for three or more days per week. Adults aged 18 or older should do at least 150minutes/week of moderate to vigorous intensity exercise with each session lasting at least 10minutes (all adults should also do muscle and bone strengthening exercises at least twice/week) while older adults (65+) with poor mobility should regularly do activities that help to improve balance and prevent falls. For example, yoga. In accordance with this recommendation, this study therefore suggests a daily participation in recreational activities for at least three days or more.

Table 4 Frequency of Participation

Frequency of Participation	Frequency	Percent
Daily	43	18.1
At least once a week	97	40.9
Quarterly	68	28.7
Yearly	14	5.9
Others	15	6.3
Total	237	100.0

Impact of Participation in Recreational Activities on Mental Health Based on the General Health Questionnaire (GHQ-12)

Respondents' information on effect of recreational activities on mental health was gauged using Mean Score analysis. The results of analysis as shown in Table 5 revealed that Feeling reasonably happy was identified as the most significant impact with a mean score 2.52 ranked 1st. followed by losing confidence with a with a mean score 2.17 ranked 2nd. Face up problems was ranked 3rd with a mean score 2.03. While able to concentrate and feeling unhappy and depressed was ranked in 4th and 5th with mean score 2.02 and 2.00. Capable of making decision, enjoy normal activities, lost much sleep and Under stress were considered as the variables with showing the least effect of participation in recreational activities on mental health in the study area (MS = 1.91,1.86,1.83, and 1.72ranked 10th to 14 respectively. These results confirmed that the overall level impact of participation in recreational activities on mental health was not more than usual as indicated by the computed MS value of 1.69 that was obtained in Table 5

.

Table 5 Impact of Participation in Recreational Activities on Mental Health Based on the General Health Questionnaire

Impact	Mean	Rank
Feeling reasonably happy	2.5274	1
Losing confidence	2.1772	2
Face up problems	2.0253	3
Able to concentrate	2.0211	4
Feeling unhappy and depressed	2.0084	5
Thinking of self as worthless	2.0000	6
playing useful part	1.9789	8
Could not overcome difficulties	1.9620	9
Capable of making decision	1.9156	10
Enjoy normal activities	1.8650	11
Lost much of sleep	1.8354	12
Under stress	1.7215	13
Overall	1.69	

Percentage of Recreational Activities impact on Mental Health

The research revealed in Table 6 the impact of recreational activities on mental health of the respondents. The impact was rated from 0 to 100%. The findings revealed that 34.6% of the respondents rated the impact on their mental health to be between 60% -90%, while 27.0% rated the impact to be between 30%-60%. Also, 20.7% rated the impact to be between 90%-100 while 11% of the respondents rated the impact to be between 10%-30% and the remaining 10% of the respondents rated the impact below 10%.

Table 6: Percentage of Recreational Activities impact on Mental Health

Impact	Frequency	Percent
below 10%	16	6.8
between 10%-30%	26	11.0
30%-60%	64	27.0
60%-90%	82	34.6
90%-100%	49	20.7
Total	237	100.0

Correlation Analysis for Duration of participation and level of impact on mental health

From the correlation analysis, Table7 shows the Pearson product correlation value was positive and low (0.140). The resulting R^2 value was also low at 14%. Correlation was found to be significant at the 0.031 level. As such, the "R" value of 0.140 indicates a weak relationship between the duration of participation in recreational activities and level of impact on mental health of the respondents. It was also empirically established that this relationship was statistically significant with P-value 0.031 which is less than 0.05 levels (2-tailed). The coefficient of determination (R2) indicated about 14% relationship between the views of the respondents.

Table 7: Correlation Analysis for Duration of Participation and level of Impact on Mental Health

Correlations		Rate the level of impact	Duration
Rate the level of impact	Pearson Correlation	1	.140*
	Sig. (2-tailed)		.031
	N	237	237
Duration	Pearson Correlation	.140*	1
	Sig. (2-tailed)	.031	
	N	237	237

*. Correlation is significant at the 0.05 level (2-tailed).

Correlation Analysis for frequency of participation and level of impact on mental health

Also, it is evident in Table 8 that the Pearson product correlation value was negative and low (-0.391). The resulting R2 value was also low at 39%. Correlation was found to be significant at the 0.00 level. The "R" value of -0.391indicates a low relationship between the frequency of participation in recreational activities and level of impact on mental health of the respondents. It was also

empirically established that this relationship was statistically significant with P-value 0.00 which is less than 0.01 levels (2-tailed). The coefficient of determination (R2) indicated about 39% relationship between the views of the respondents.

Table 8 Correlation Analysis for frequency of participation and level of impact on mental health

Correlations		How often do you participate	Rate the level of impact
How often do you participate	Pearson Correlation	1	-.391**
	Sig. (2-tailed)		.000
	N	237	237
Rate the level of impact	Pearson Correlation	-.391**	1
	Sig. (2-tailed)	.000	
	N	237	237

**. Correlation is significant at the 0.01 level (2-tailed).

Analysis of Socio-demographic characteristics as determinant for Variation in the level of impact on mental health

This section shows the variation in effect of participation in recreational activities on the basis on socio- demographics of respondents using the highest ranked impact (feeling reasonably happy) in the general health questionnaire (GHQ-12) Likert scaling method as the dependent variable and Marital status, Occupation, Gender, Highest Educational attainment, Religion, Monthly income, and age as predictors (independent variables). The result shows that much of the variance in the dependent variable is explained by the regression model with Multiple R = 0.373, Adjusted R Square = 0.113 and the R Square of 0.139 as shown Table 9. This implies that the regression model used explains about 13.9% of the variance in socio-economic characteristics. The result (F=5.284, P=0.00) also implies that the result is statistically significant at P<0.05 (Table 9).

Table 9: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.373[a]	.139	.113	.95201

a. Predictors: (Constant), Marital status, Occupation, Gender, Highest Educational attainment, Religion, Monthly income, and age

Analysis of Variance (ANOVA) and Regression Coefficients of Socio-demographic variable on Mental Health

The analysis of variance (ANOVA) and regression coefficients in Table 10 shows the level of contributions of each predictor in explaining the dependent variable. It can be seen from this result that of the 7 independent variables included in this regression model, 2 were significant predictors of the effect of participation in recreational activities on mental health of the respondents. The variables in order of importance are religion (Beta = 0.298, T=4.410; P value=0.000); this suggests that religion is the strongest predictor of participation in recreational activities and thus a key contributor to mental health in this survey. Next to it is highest educational attainment (Beta=0.147, T=2.080, P=0.039). While others such as monthly income (Beta=-0.093, T=1.225, P=0.211),

marital status (Beta=0.73, T=0.061P =0.337), gender (Beta=-.006, T=-0.088, P=0.930), occupation (Beta=-0.007, T=-0.104, P=0.917) and age (Beta =-0.040, T=-0.474, P=0.636) are insignificant. In other words, religion and highest educational attainment are significant in the variation of impact on mental health of respondents' while age, gender, monthly income, marital status and occupation of respondents are insignificant when it comes to variation of impact on their mental health Table 11.

Table 10: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	33.525	7	4.789	5.284	.000[b]
	Residual	207.547	229	.906		
	Total	241.072	236			

a. Dependent Variable: Feeling reasonably happy

b. Predictors: (Constant), Marital status, Occupation, Gender, Highest Educational attainment, Religion, Monthly income, socio economic and socio demographic characteristics of respondent

Table 11 Regression Coefficients of Socio-demographic variables

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
(Constant)	.168	.450		.373	.709
Age	-.037	.079	-.040	-.474	.636
Gender	-.012	.132	-.006	-.088	.930
Religion	.680	.154	.293	4.410	.000
Monthly income	.068	.054	.093	1.255	.211
Occupation	-.005	.046	-.007	-.104	.917
Highest Educational attainment	.313	.151	.147	2.080	.039
Marital status	.092	.095	.073	.961	.337

a. Dependent Variable: Feeling reasonably happy

CONCLUSION AND RECOMMENDATIONS

Recreational activities have been helpful in sustaining mental health stability although it is not without disadvantage. As such, a continuous assessment of its impact on mental health is inevitable. Therefore, the research assessed the impact of participation in the recreational activities on mental health of residents in Abuja. The findings' revealed respondents' have been involved in all the recreational activities at some point in their lives, but the degree of participation is lower than 40%. The most significant reason for participation is for relaxation. These findings verified the overall impact of recreational activities using the general health questionnaire (GHQ-12). Result from analysis showed that recreation has both a positive and negative impact on mental health although the impact was not more than usual. Most of the participants were male in their youthful age and the level of impact was rated between 60% - 90% by 50% of the respondents'. Further analysis revealed that frequency and duration of participation in recreational activities is statistically significant to its impact on mental health. The level of significance is however weak/low by 39% and 14% respectively. Similarly, religion and highest educational attainment show a significant

relationship to the variation of impact experienced by respondents while Age, gender, occupation, monthly income, and marital status are insignificant to the impact on mental health of the various respondents. In view of the findings of the study, the study recommends that there should be sustained advocacy campaigns through collaborative efforts of the government, non-governmental organizations, faith and community-based organizations using symposia, workshops, and the radio to enlighten the public on the importance and disadvantages of recreation. Since, engaging in regular recreational and sports activities over extended periods of time is said to be effective in eliminating the depressive and health. Therefore, individuals particularly females and the elderly should develop the attitude of engaging in recreational activities for at least 30minutes per day. Furthermore, Government and recreation planners should establish policies that would incorporate recreational activity participation across various sectors. Recreation planners should establish plans that would encourage active recreation across the nation. In addition, Private organizations should also incorporate recreation into working environment to ease employees from stress and to ensure mental stability.

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