Can Productivity Increase? Sedentary Leisure Factors Among University Staff in Ghana

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Abstract. The study seeks to examine the prevailing sedentary leisure attitude factors at multiple levels (intrapersonal, interpersonal and institutional) among university staff in Ghana. 28 survey items to measure 5 variables, using self-reported responses are designed. Three categories of 33 universities were randomly sampled using a lottery method including 6 Traditional Public Universities, 5 Technical Universities and 22 Private Universities. Thirty participants were selected from each university and 35 participants from private universities. A total of 995 respondents participated in the study. The IBM SPSS for Windows Version 25.0 and SmartPLS 3.3.3 was used in data analysis. The results precisely suggest that sedentary leisure behaviour can augment university staff's productivity. Sedentary leisure behaviour and university staff's productivity nexus significantly differed based on religion and working hours. Thus, gender and employment classification groups do not moderate the relationship between sedentary leisure behaviour and the productivity of staff but religion and working hours do.

Keywords: Sedentary · Leisure · Productivity · University · Ghana

1 Introduction

Despite an extensive body of data supporting active lives, sedentary and inactive behaviours continue to increase at an alarming pace globally [1]. A sizable proportion of the global population (20% of male adults and 27% of female adults aged 18–64 years) do not meet the World Health Organization's guidelines of at least 150 min of moderate-intensity physical activity per week or at least 75 min of vigorous-intensity physical activity once a week, or an equivalent combination of moderate-intensity and vigorous-intensity activity [2]. Consequently, physical inactivity has been recognised as a significant risk factor for morbidity and early death, posing perhaps the twenty-first century's most critical public health problem [3]. Although the primary consequences of sedentary and inactive lifestyles are directly related to an individual's health and well-being, with an estimated cost of USD 67.5 billion per year to the global economy and GBP 1.5 billion in the UK, there are increasing pressures on health service providers, resulting in physical inactivity being recognised as a national and international priority [3].

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Given the negative health consequences of excessive sedentary behaviour, public health experts have devoted significant effort to developing treatments to promote more active lifestyles, especially among office employees. Nevertheless, ensuring that sedentary behaviour reductions do not negatively impact productivity. Reference [4]opined that this is likely to be critical for employers, particularly given that there is the possibility of decreased productivity due to workplace sedentary leisure interventions. Productivity issues are also identified as a major impediment to workplace sedentary leisure transformation. These worries appear reasonable, considering that sedentary behaviour decreases may require workers to leave workstations or potentially substitute physical activity time for work time [5].

Empirical evidence has shown several workplace-based intervention studies on sedentary leisure discovered no impact on productivity [6], while others discovered an increase or perceived improvement in productivity [7]. However, further study on the effect of sedentary leisure factors on productivity is necessary since the relationship between these two variables has been inconsistent [8]. Reference [9] found that more sitting time is linked with poorer work engagement in cross-sectional research. Two more cross-sectional studies investigated the connection between sedentary leisure activities and productivity, with conflicting findings. Reference [10] found no correlation between sedentary leisure activities and productivity in a sample of about 550 office workers at a Spanish university [11]. In comparison, found that workers aged 20 to 39 years who engaged in more sedentary leisure in the workplace were more likely to report being less efficient than those who engaged in less sedentary leisure on the job [12]. Ghana, on the other hand, is governed by labour law, which mandates working for eight (8) hours per day, five (5) days per week, and two (2) days off as in public service.

Given these conflicting findings, further studies on sedentary leisure attitude factors at multiple levels (intrapersonal, interpersonal and institutional) are pertinent in Ghana. Besides, studies on the effect of sedentary leisure factors on productivity among university staff in Ghana are lacking. The current study is also important because previous studies failed to segment the sedentary leisure factors at multiple levels but rather looked at them holistically. The study seeks to fill the research gap by examining the prevailing sedentary leisure attitude factors at multiple levels (intrapersonal, interpersonal and institutional) among university staff in Ghana. The study further investigates the effect of the prevailing sedentary leisure attitude factors identified on productivity levels among university staff in Ghana.

An empirical review of the research proved that worksite-based, sedentary leisure research, productivity metrics are very prevalent; analyses have identified 20 studies with some measure of productivity [13]. Some worksite-based intervention studies that addressed sedentary leisure have shown no effect on productivity [14], while others found an increase or perceived improvement in productivity [15]. According to reviews of this body of evidence, measures to reduce sedentary leisure do not have a significant influence on productivity. However, this body of data also shows that more research into the relationship between sedentary leisure at work and productivity is needed, as the relationship between these two factors has not been consistently established [16]. Reference [9] found that more sitting time is linked to lower work engagement in a cross-sectional study.

Other research has looked into the link between sedentary leisure and productivity, with varying findings. A study by [10] of around 550 office employees at a Spanish university revealed no significant link between working sitting time and productivity.

In contrast, a study of over 2500 Japanese people conducted by [17] suggested employees aged 20 to 39 who reported having more job-related sedentary leisure were more likely to report being less efficient than those who reported having less job-related sedentary leisure. Further research into additional elements linked with sedentary leisure and/or productivity, such as intrapersonal, interpersonal, and institutional aspects, is needed in light of these seemingly contradicting results.

Reference [18] conducted a study on leisure constraints within the university setting in Ghana. The findings indicate that students favoured sedentary leisure activities. The students confronted significant interpersonal restrictions. Female students were more confined by interpersonal constraints than male students, interpersonal constraints than older students more hampered younger students, and students with lower incomes were more constrained by intrapersonal limitations than those with higher incomes. In another study, [19] evaluated university-based office employees' compliance using an inclinometer-based device. They discovered that workday was spent sitting, and frequent breaks were unusual, sitting time at work occurring in bouts of 55 or more minutes.

1.1 Theoretical Underpinnings

The hierarchical leisure constraints model was used as the theoretical foundation for this research [20]. A hierarchy of limitations on leisure participation is maintained in this model, and as a result, various types of constraints on leisure participation are targeted and overcome depending on this hierarchy. People who want to engage in leisure activities are, according to this model, initially faced with intrapersonal constraints (such as a lack of skills, competence, and a sense of social inappropriateness on their side) that limit their interests. Interpersonal limitations (impact from peers, cultural and social conventions, values and expectations) will come to the fore if the individual can overcome intrapersonal restraints. On the other hand, institutional constraints have a greater impact on a person's capacity to engage in leisure activities and act as a bridge between intrapersonal and interpersonal constraints. Lack of facilities, lack of time, money and transit facilities are only a few examples of institutional restrictions that stand in the way of a person's leisure hobbies becoming a reality. Increasing participation in leisure activities is probable if these issues can be successfully resolved or negotiated [20].

Barriers, according to their models, impede the desire for and participation in leisure activities. When a barrier to involvement obstructs or hinders engagement, leisure preference occurs. They define restrictions as intervening elements in their investigation. Reference [21] explored perceived intrapersonal, interpersonal, and structural limits to nature-based travel and tested the constraint model in a nature-based tourism scenario. They discovered that people's views of constraints varied based on their financial level, family life cycle, and age. Reference [22] tested the concept on teenage students and found evidence for the hierarchy of significance of leisure constraints. Reference [23] use data from a sample of mentally challenged persons to replicate and enhance prior work on leisure constraints construct development.

1.2 Sedentary Leisure Constraints

Sedentary leisure was assessed as the number of hours per day spent watching television, using a home computer, or engaging in general leisure on a typical weekday or weekend day [24]. Leisure constraints are perceived or actual causes for a person to be prevented or restricted from engaging in leisure activities [25, 26]. Constraint categories are useful for defining the primary types of constraints that affect participation in leisure activities [25]. The concept of leisure constraints divided them into three distinct categories: intrapersonal, interpersonal, and structural. More subsequently, [27] and [28] proposed that constraints are "nested" within a single model built on a hierarchy of these three types.

Intrapersonal constraints pertain to one's beliefs oneself, which largely influence how preferences are expressed. Self-reported ability, attitudes toward kin and nonkin, and perceived appropriateness of activities are all instances of this group [27]. Interpersonal constraints are those that arise as a consequence of connections with others. For instance, the capacity to locate a partner or buddy with whom to pursue the desired leisure activity, financial and time constraints, and an abundance of family commitments are all examples. Reference [22] noted that people might face interpersonal constraints if their leisure activities are influenced by others such as family, friends, or partners. The availability of time and money and the effect of other commitments within the living unit are often relationship-driven for persons with mental impairment. Structural constraints relate to the resources and causes that stand in the way of leisure choices and participation in activities. This category encompasses transportation and facilities restrictions and the availability of possibilities [22].

Socio-Demographic Characteristics and Leisure Constraints

Some studies have linked leisure constraints to race, ethnicity, culture, religion, age, gender, and socioeconomic status [29–31] Age, ethnicity and income levels may determine what constitutes a constraint for a person [32]).

Age-related differences in leisure constraints have also been discovered. The breadth of control over one's personal life is supposed to evolve as one advances through the lifespan (from childhood to old age). The ability to take charge and make independent judgments tends to influence the type and nature of restrictions encountered in leisure [33]. Reference [34] identified severe parental control, a lack of appropriate cash to engage in a preferred activity, the requirement for parental approval, and peer interests as leisure restrictions for children aged 13 to 15. Lack of time and demanding job schedules, on the other hand, was shown to limit leisure involvement among persons aged 18 to 25. [35]. According to a review of published research, different levels of leisure limitations exist among participants of various ages. Given the various activity interests and engagement levels based on age, [36] and [37] hypothesized that the type and form of limitations will differ based on age.

In the discourse of leisure, sex is possibly one notion that has gotten a lot of academic attention. According to the literature, there are disparities in the types and levels of limitations experienced by men and women [29, 30, 38, 39]. Males are typically cited as being confined by intrapersonal restraints, whilst females are typically constrained by interpersonal and structural constraints [30]. Female activities are, for the most part,

considered the epitome of their daily problems in social life, which tends to limit them in all parts of life, including leisure [40]. On the other side, it is claimed that because social systems are patriarchal, males' leisure is restricted less than that of their female counterparts. For example, [30] found that women were more restrained by sociocultural constraints (intrapersonal) than their male counterparts in a study on the leisure constraints of Iranian women. Reference [40] showed that women were constrained by time, social inappropriateness, and a lack of engagement (interpersonal constraints), whereas men were constrained by a lack of skills and interest (intrapersonal constraints).

While this research assessed several components of the sedentary time pattern, it focused only on sitting at work and did not include measures of light-intensity exercise, nor did it include sedentary time outside of work hours. The research model is depicted in Fig. 1.

The influence of sedentary leisure behaviours on employee productivity is rooted in resource theories like the effort-recovery (ER) model [41], social capital theory (SCT;[42]), conservation of resources (COR) theory [43] and the enrichment model. These theories assume that workers have a certain number of personal resources at their disposal [44]. Cognitive resources, physical energy, and emotional energy are all examples of personal resources [45] that may be useful in the workplace [44]. These resources may be exhausted by the end of the day [41]. The need for rest and recuperation after a long day at work becomes apparent. When pressures are removed and personal resources are not utilised in the same way as they are at work, workers have a better chance of recovering [44].

Following these theories, sedentary leisure activities constitute an important resource. Workers may utilise their leisure time to get ready for the following day's job with the aid of resource caravans [44]. In addition to coping with stresses (and preventing stress build-up), employees may seek diversion and relaxation in their leisure time, allowing them to begin the following workday with an abundance of personal resources to help them perform better [46]. Enrichment theory suggests that non-work activities, such as leisure, can provide resources that enhance performance and well-being in other areas [47]. With these insights, we analyse whether workers utilise sedentary leisure activities to obtain physical and emotional vitality for work as demonstrated in high production levels. Considering these discussions, the following hypotheses are proposed.

H1: Intrapersonal sedentary leisure behaviour influences university staff productivity.

H2: Interpersonal sedentary leisure behaviour influences university staff productivity.

H3: Institutional sedentary leisure behaviour influences university staff productivity.

H4: The extent of the relationship between sedentary leisure behaviour and university staff productivity varies across different demographic variables including gender, employment classification, religion and working hours of university staff in Ghana.

Productivity

Simply expressed, productivity is production efficiency: how much output is produced from a given set of inputs. As a result, it is commonly stated as an output-input ratio. Single-factor productivity measurements show output units produced per unit of certain

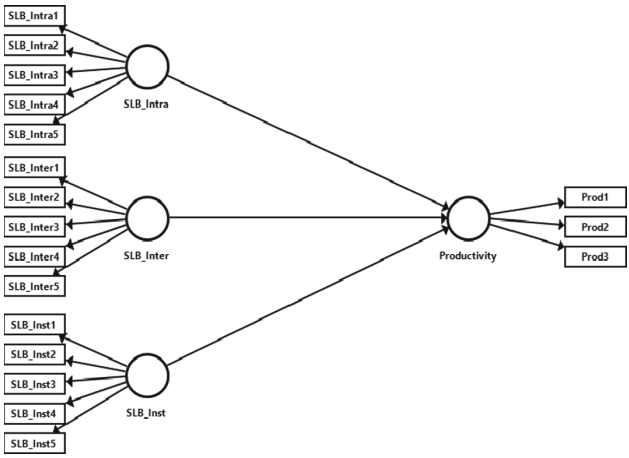

Fig. 1. Research model

input. Labour productivity is the most prevalent sort of measure of this type, however, capital and even material productivity measurements are used on occasion [48]. Of course, the intensity with which the omitted inputs are used affects single-factor productivity levels. Even if two producers utilize the same production technique, their labour productivity levels may be substantially different if one uses capital much more intensively, for example, due to different factor pricing [49].

For more than two centuries, the idea of productivity, broadly defined as the relationship between output and input, has been available and applied in a variety of settings at various levels of aggregation in the economic system. It is argued that productivity is one of the most significant basic variables influencing economic production activities [50].

Despite the complexity surrounding the subject, there are distinguishing qualities that represent the concept of productivity. In general, productivity is defined in industrial engineering as the relationship between output (i.e., created goods) and input (i.e., consumed resources) in the manufacturing transformation process. Productivity is thus, on the one hand, inextricably linked to the usage and availability of resources [51]. This means that if a company's resources are not employed appropriately or if there aren't enough of them, productivity suffers. Productivity, on the other hand, is inextricably related to the generation of value. As a result, high productivity is achieved when activities and resources in the manufacturing transformation process give value to the finished goods. Furthermore, waste is the polar opposite of productivity and must be removed to boost production. Productivity gains in earlier studies by [52] can be attributed to five main linkages:

1. Both output and input increase, but input increases proportionally less than output.
2. The output increases while the input remains constant.
3. The output increases while the intake decreases.
4. The output remains constant as the input diminishes.
5. Output falls while intake falls even further.

It is also critical to comprehend the ambiguous nature of productivity, as there are various forms of productivity as well as different hierarchical levels within which productivity can be discussed. Almost any transformation process within a manufacturing organization receives many forms of input (e.g., labour, capital, material, and energy) and produces multiple outputs (e.g., product A, product B). As a result, we must be able to distinguish between partial productivity (output connected to a single kind of input) and total productivity (output related to numerous types of input) [51]. Furthermore, given the various hierarchical levels that exist in a firm, it is not difficult to understand why, for example, the management's strategic perspective on productivity will normally differ from the more operational one.

2 Methods

2.1 Study Design and Participants

We surveyed the teaching and non-teaching staff in selected Ghana universities. The Universities have been chosen into three categories: Traditional Public Universities, Technical Universities and Private Universities in Ghana. The participants were selected from these universities to achieve a fair representation of all university staff participating in the study. After receiving formal approval from the Directorate of Human Resources of the ten (10) Universities sampled for the study, an invitation to complete an interest survey was sent to emails of the staff in their institutions. The questionnaire was uploaded onto google forms, and the link was sent to the emails and WhatsApp of the participants sampled to complete at their own chosen time. The data collection for the study span from September-November 2021. The respondents were not compensated for participating in the study. There are sixty-five (65) universities in Ghana comprising ten (10) Traditional Public Universities, ten (10) Technical Universities and forty-five (45) Private Universities. Thirty-three (33) universities consisting of Six (6) from Traditional Public Universities and five (5) from Technical Universities, and for Private Universities, twenty-two (22) were chosen. The universities were sampled using a simple random sampling technique using the lottery method. Thus, a total sample of 995 respondents took part in the study.

2.2 Instrumentation and Procedures for Data Collection

The study designed twenty-eight (28) survey items to measure five (5) variables, using self-reported responses: demographic data (ten items), intrapersonal (five items), interpersonal (five items), institutional (five items) and productivity (three items). The participants' demographic data comprises age, gender, religion, level of education, marital status, employment classification (teaching/non-teaching staff) and several years in the current position and current working hours. The sedentary leisure attitude factors were self-reported and assessed at multiple levels, intrapersonal, interpersonal, and institutional. The survey items for the sedentary leisure attitude factors were adapted from existing validated questionnaires [10, 11]. To assess the level of productivity, survey items from existing validated questionnaires were employed [53]. Participants were

asked to consider the previous seven days while responding to all sedentary leisure attitude factors and productivity measures. The original validated questionnaires' sedentary leisure attitude factors sub-constructs were rated on a five-point Likert scale ranging from strongly agree to represent 1 to strongly disagree representing 5. Thus, the sub-contracts in the original validated questionnaires were modified to reflect the Ghanaian university settings. Sample items are presented in Table 1.

Table 1. Measures

Construct	Measurement	Item	Previous Source
Demographic	Age, gender, religion, level of education, marital status, employment classification, number of years in the current position and current working hours were included.	What are your current working hours?	n/a
Intrapersonal factors	5-items adapted from [11] and [12] were measured on a five-point scale; where 1 = strongly disagree and 5 = strongly disagree	It is my choice whether I pause my official work to have some leisure time	Occupational Setting and Physical Activity [11] and [12]
Interpersonal factors	5-items adapted from [11] and [12] were measured on a five-point scale; where 1 = strongly disagree and 5 = strongly disagree	Work colleagues collectively decide to stand up and engage in any physical activity with my colleagues at work	Occupational Setting and Physical Activity [11] and [12]
Institutional	5-items adapted from [11] and [12] were measured on a five-point scale; where 1 = strongly disagree and 5 = strongly disagree	It's an institutional policy or permits to pause official work to have some leisure time	Occupational Setting and Physical Activity [11] and [12]
Productivity	3-items adapted from [53] were measured on a five-point scale; where 1 = strongly disagree and 5 = strongly disagree	My overall quality of work improved in the last 7 days	Health and work Questionnaire, [53]

2.3 Data Analysis

The data collected with the research instrument was edited for inconsistencies in the responses. The IBM SPSS for Windows Version 25.0 and SmartPLS 3.3.3 were used to analyse the data. The sample's demographic characteristics were summarized using descriptive statistics. Following that, the research framework and associated hypotheses were examined using partial least squares structural equation modelling (PLS-SEM), which has a higher level of statistical power for predicting the relationships between all latent constructs (both reflective and formative) concurrently [54, 55]. Before evaluating the structural model, the measurement model was evaluated [54]; [55]. To calculate factor loadings, path coefficients, and their relative significance levels, a PLS method was used followed by bootstrapping sampling (5000 resamples). Additional analyses, such as PLS-MGA and IPMA, were undertaken.

3 Results and Discussion

3.1 Results

Demographic Profile of the Sample

As depicted in Table 2, the majority (37.8%) of the sample was aged between 46 to 55 years. The sample was male-dominated by 62.9% while 37.1% were females. In terms of religion, the majority (80.5%) were Christians while 19.5% were Muslims. Lastly, 67.2% were first-degree students whereas the rest 32.8% were graduate students. Further, for the level of education and marital status, most of the sample were Masters's degree holders (56.5%) and married (73.7%). Both teaching (63.6%) and non-teaching staff (36.4%) participated in the survey. Most of the respondents had 4 to 7 years of working experience in the universities and the sample was dominated by regular full-time staff (87.7%) followed by regular part-time staff (10.8%).

Measurement Model Assessment

Following the guidelines by [54], the measurement model was evaluated to determine the constructs' validity and reliability. Thus, this section discusses factor loadings and reliability, construct reliability, and convergent and discriminant validity [56].

Table 3 summarises the item loadings and reliability, as well as the constructs' reliability and convergent validity. All factor loadings are more than 0.708, indicating that they are substantial and reliable. Cronbach's alpha (CA) values varied from 0.881 to 0.964, while the composite reliability (CR) values ranged from 0.927 to 0.972, and all AVE values were more than 0.50. These requirements indicate that the constructs are sufficiently reliable and convergently valid [54, 57].

The discriminant validity was assessed using HTMT and HTMT2 criteria which are regarded as the most appropriate means of establishing discriminant validity of the measurement model [58–60]. As shown in Tables 4 and 5, the HTMT and HTMT2 values were less than the 0.90 thresholds. Through the results of bootstrapping for HTMT and HTMT2, the confidence intervals showed that the upper confidence intervals are below 1. Consequently, the discriminant validity of the constructs is established [56, 58, 60].

Table 2. Respondents' profile

Characteristics		**Frequency**	**%**
Age	Less than 25 years	15	1.5%
	25–35 years	100	10.1%
	36–45 years	262	26.3%
	46–55 years	376	37.8%
	56–65 years	221	22.2%
	Above 65 years	21	2.1%
	Total	*995*	*100.0%*
Gender	Male	626	62.9%
	Female	369	37.1%
	Total	995	100.0%
Religion	Christian	801	80.5%
	Muslim	194	19.5%
	Total	*995*	*100.0%*
Education	First degree	45	4.5%
	Masters	562	56.5%
	PhD	388	39.0%
	Total	*995*	*100.0%*
Marital Status	Single	152	15.3%
	Married	733	73.7%
	Separated	24	2.4%
	Divorced	37	3.7%
	Widow(er)	49	4.9%
	Total	*995*	*100.0%*
Employment Classification	Teaching staff	633	63.6%
	Non-teaching staff	362	36.4%
	Total	*995*	*100.0%*
Tenure (Experience)	Less than 4 years	208	20.9%
	4–7 years	401	40.3%
	8–11 years	302	30.4%
	12–15 years	60	6.0%
	More than 15 years	24	2.4%
	Total	*995*	*100.0%*

(*continued*)

Table 2. (*continued*)

Characteristics		**Frequency**	**%**
Current Working Hours	Regular Full-Time	873	87.7%
	Regular Part-Time	107	10.8%
	Temporary Full-Time	3	0.3%
	Contract	12	1.2%
	Total	*995*	*100.0%*

Table 3. Reliability and Convergent Validity Results

Indicator	**Indicator Loadings**	**Indicator Reliability**	***SE***	***t*-statistics**	***p*-values**	**CA**	**CR**	**AVE**
SLB_Intra1	0.896	0.803	0.011	80.266	0.000	0.950	0.961	0.832
SLB_Intra2	0.930	0.864	0.006	147.002	0.000			
SLB_Intra3	0.894	0.799	0.011	78.554	0.000			
SLB_Intra4	0.930	0.865	0.006	166.832	0.000			
SLB_Intra5	0.911	0.831	0.007	127.352	0.000			
SLB_Inter1	0.831	0.691	0.015	55.351	0.000	0.930	0.947	0.782
SLB_Inter2	0.917	0.840	0.007	136.553	0.000			
SLB_Inter3	0.875	0.766	0.012	71.455	0.000			
SLB_Inter4	0.913	0.834	0.006	140.770	0.000			
SLB_Inter5	0.882	0.778	0.008	111.460	0.000			
SLB_Inst1	0.923	0.851	0.009	102.308	0.000	0.964	0.972	0.874
SLB_Inst2	0.945	0.892	0.005	184.251	0.000			
SLB_Inst3	0.923	0.852	0.009	102.519	0.000			
SLB_Inst4	0.948	0.899	0.005	199.243	0.000			
SLB_Inst5	0.937	0.877	0.005	179.381	0.000			
Prod1	0.856	0.733	0.015	56.954	0.000	0.881	0.927	0.809
Prod2	0.918	0.842	0.006	154.835	0.000			
Prod3	0.923	0.852	0.006	164.652	0.000			

Notes: SLB_Intra = Sedentary Leisure Behaviour (Intrapersonal); SLB_Inter = Sedentary Leisure Behaviour (Interpersonal); SLB_Inst = Sedentary Leisure Behaviour (Institutional); Prod = Productivity; SE = Standard Error; CA = Cronbach's alpha(α); CR = Composite Reliability; AVE = Average Variance Extracted

The discriminant validity of the measurement model was determined using the HTMT and HTMT2 criteria, which are widely considered the most acceptable methods for demonstrating discriminant validity [58–60]. The HTMT and HTMT2 values were

below the 0.90 criterion, as reported in Tables 3 and 4. The findings of bootstrapping indicated that the upper confidence intervals for HTMT and HTMT2 are less than 1. As a result, the constructs' discriminant validity is demonstrated [56, 58, 60].

Structural Model Assessment

Before the assessment of structural relationships, collinearity, predictive power and relevance were examined. The inner VIF values were less than 3 suggesting collinearity was not a critical issue in this study. The R2 and Q2 criteria were used to evaluate the predictive power and accuracy of the structural model respectively [54].

As revealed in Table 6 and Fig. 2, the model exhibited substantial levels of predictive power (R2 = 0.769) and predictive relevance (Q2 = 0.617) [54]; [61]. Specifically, the results show that sedentary leisure behaviour (intrapersonal, interpersonal and institutional) explains 76.9% of the variance in the university staff productivity.

To test hypotheses H1, H2 and H3, the structural model was examined using a bootstrapping technique specifying 5,000 resamples. The results from the hypotheses tests revealed that intrapersonal sedentary leisure behaviour ($\beta = 0.424$; SE = 0.035; CI = 0.356 – 0.493; t = 12.062; $p < 0.001$; f2 = 0.454; large effect size), interpersonal sedentary leisure behaviour ($\beta = 0.289$; SE = 0.030; CI = 0.235 – 0.354; t = 9.531; $p < 0.001$; f2 = 0.185; medium effect size) and institutional sedentary leisure behaviour ($\beta = 0.304$; SE = 0.033; CI = 0.242 – 0.373; t = 9.215; $p < 0.001$; f2 = 0.187; medium effect size) significantly positively predicted university staff productivity. These results provide support for hypotheses H1, H2 and H3.

PLS-Multi-group Analyses (MGA)

"Heterogeneity arises when two or more groups of respondents display substantial variances in their model relationships". Additionally, they emphasised that comparing many

Table 4. Discriminant Validity By Heterotrait-Monotrait Ratio Of Correlations (HTMT)

Construct	SLB_Intra	SLB_Inter	Prod	SLB_Inst
SLB_Intra				
SLB_Inter	0.589			
Prod	0.842	0.797		
SLB_Inst	0.639	0.704	0.821	

Table 5. Discriminant validity by HTMT2

Construct	SLB_Intra	SLB_Inter	Prod	SLB_Inst
SLB_Intra				
SLB_Inter	0.578			
Prod	0.835	0.780		
SLB_Inst	0.636	0.698	0.814	

Table 6. Structural equation model and hypotheses results

Path	VIF	β	*SE*	f^2	Confidence Interval		*t*-statistics (*p*-values)	$R^2(Q^2)$
					2.50%	97.50%		
SLB_Intra => Prod	1.712	0.424	0.035	0.454	0.356	0.493	12.062 (0.000)	0.769 (0.617)
SLB_Inter => Prod	1.952	0.289	0.030	0.185	0.235	0.354	9.531 (0.000)	
SLB_Inst => Prod	2.141	0.304	0.033	0.187	0.242	0.373	9.215 (0.000)	

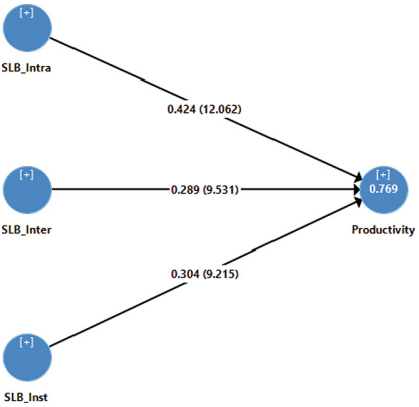

Fig. 2. Structural model depicting the effects of sedentary leisure behaviour on productivity

groups of respondents is advantageous from a theoretical and practical standpoint, and that failing to acknowledge heterogeneity might jeopardise PLS-SEM findings by resulting in erroneous conclusions. Using demographic data as categorical moderating factors, the MGA demonstrates how data set heterogeneity may offer insight into our thinking. Thus, the fourth hypothesis (H4) is investigated by employing PLS-MGA with the percentile bootstrapping technique. Table 7 demonstrates the significant differences between groups.

According to [62], percentages less than 0.05 and more than 0.95 indicate a significant difference in a given PLS path coefficient between groups in PLS-MGA. If the p-value is less than 0.05 or more than 0.95, the result is significant at the 5% error level. The percentile below 0.05, according to Henseler et al. (2009), suggests that group 1's bootstrapping findings are better than group 2. Furthermore, percentiles greater than 0.95 imply that group 2's bootstrapping findings are superior to group 1.

From Table 7, the path coefficients of SLB_Intra → Prod and SLB_Inter → Prod are significantly different based on religion and working hours. Specifically, the path coefficient for SLB_Intra → Prod is higher in Muslims than Christians whereas the path

Table 7. PLS-MGA results for gender, staff category, religion and working hours

Path	*p*-value (Male vs Female)	*p*-value (Teaching vs Non-Teaching)	*p*-value (Christian -1.0 vs Muslim (2.0))	*p*-value (Regular Full-Time (G1) vs Regular Part-Time (G2)
SLB_Intra - > Prod	0.770	0.487	*0.991**	*0.028**
SLB_Inter - > Prod	0.059	0.746	*0.001**	*0.995**
SLB_Inst - > Prod	0.679	0.309	0.325	0.078

*Note: * Indicates the significant difference between groups*

coefficient for SLB_Inter → Prod is higher in Christians than Muslims. Similarly, the path coefficient for SLB_Intra → Prod is higher in regular full-time staff than regular part-time staff whereas the path coefficient for SLB_Inter → Prod is higher in regular part-time staff than regular full-time staff. However, all three path coefficients are not significantly different for gender (males vs females) and employment classification (teaching vs non-teaching staff).

Importance-Performance Map Analysis (IPMA)

Further investigation was carried out to analyse the relative priority and performance of the three forms of sedentary leisure behaviour as predictors of university staff productivity. Thus, this analysis considers the performance of intrapersonal sedentary leisure behaviour, interpersonal sedentary leisure behaviour and institutional sedentary leisure behaviour on a target construct, university staff productivity [63]. The results of IPMA can help decision-makers to prioritize their actions [63]. Figure 3 shows the IPMA results.

Figure 3 schematically shows the IPMA results of the university staff productivity target variable within which the intrapersonal sedentary leisure behaviour has the highest importance (0.397), followed by interpersonal sedentary leisure behaviour and institutional sedentary leisure behaviour with total effects of 0.261 and 0.253, respectively. However, interpersonal sedentary leisure behaviour has the highest performance (34.590), followed by institutional sedentary leisure behaviour (34.154) and intrapersonal sedentary leisure behaviour (28.080). Considering these findings, intrapersonal sedentary leisure behaviour is of fundamental relevance in determining the productivity of university staff members. As a result, management initiatives aimed at increasing the productivity of university personnel should be concentrated on the intrapersonal sedentary leisure behaviour construct.

3.2 Discussion

This study examined the effect of the prevailing sedentary leisure attitude factors (i.e., intrapersonal, interpersonal and institutional) on productivity among university staff

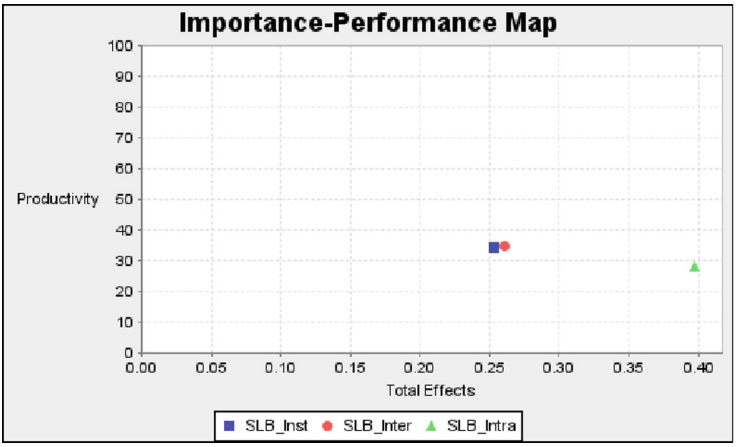

Fig. 3. IMPA on productivity

in Ghana. The results from the PLS-SEM analysis revealed that sedentary leisure behaviour characterised by intrapersonal, interpersonal and institutional factors significantly and positively affected university staff productivity. These results provide support for hypotheses H1, H2 and H3. This finding is consistent with a previous study by [17] but contradicts the findings of [10]. Reference [4] opined that this is likely to be critical for employers, particularly given that there is the possibility of decreased productivity due to workplace sedentary leisure interventions. The results specifically suggest that sedentary leisure behaviour can augment university staff's productivity. Thus, high sedentary leisure activities were associated with high levels of productivity among university personnel, compared with those who reported less sedentary leisure time at work [12].

These findings corroborate the resources theories like the ER model, SCT, COR and the enrichment model which suggest sedentary leisure activities constitute an important resource. One possible explanation is that slack time may have enhanced productivity because it provided people with mastery experiences that allowed them to develop their self-efficacy. For this reason, taking time to relax and recharge one's mental and emotional energies is critical to one's ability to function well at work. Employees' work performance and business success may be affected by their participation in leisure activities, which is a valuable resource for employers. Because people may choose whether or not they want to spend time on a leisure activity, this shows that leisure is an essential source of resources because it gives people a lot of freedom and control over how they spend their time.

Furthermore, this study finds that the relationship between sedentary leisure behaviour and university staff's productivity did not significantly differ based on gender and employment classification (i.e., teaching vs non-teaching staff). However, the sedentary leisure behaviour and university staff's productivity nexus significantly differed based on religion and working hours. Thus, gender and employment classification groups do not moderate the relationship between sedentary leisure behaviour and the

productivity of university staff. However, religion and working hours (i.e., regular full-time vs regular part-time) moderate the relationship between sedentary leisure behaviour and university staff's productivity. These results provide partial support for hypothesis H_4. These findings are novel as previous studies did not consider the differences in the relationship between sedentary leisure behaviour and employees' productivity based on demographic variables.

4 Conclusions

The present study examined the effect of the prevailing sedentary leisure attitude factors (i.e., intrapersonal, interpersonal and institutional) on productivity among university staff in Ghana. The results proved that sedentary leisure behaviour characterised by intrapersonal, interpersonal and institutional factors significantly and positively predicted university staff productivity. Furthermore, this study proved that the relationship between sedentary leisure behaviour and the productivity of university staff is not contingent on gender and employment classification but contingent on religion and working hours. The current study, therefore, offers a unique and better comprehension of the effects of sedentary leisure behaviour characterised by intrapersonal, interpersonal and institutional factors on university staff's productivity in a developing economy.

4.1 Managerial Implications

These research findings have significant implications for university administrators, as well as those in related fields. Managers should note that the significance of the sedentary leisure behaviour-productivity nexus differs across religion and working hours. Top management may choose which aspects of the work environment should be altered to improve productivity. The results are beneficial to leisure researchers and practitioners because they demonstrate empirically that increased sedentary leisure behaviour fits the demands and enhances the performance of university workers. Given the high R^2 value of 77%, managers may deduce that increasing the intrapersonal, interpersonal, and institutional facets of sedentary leisure behaviour can result in concurrent gains in staff productivity. The results are significant and contribute to the body of knowledge by providing a better understanding of the consequences of sedentary leisure behaviour on productivity on an intrapersonal, interpersonal, and institutional level. With this insight, managers will be more equipped to increase staff productivity, therefore sustaining a competitive edge and assuring the firm's continuing existence.

The findings of PLS-MGA implied that there exist significant differences across religion and working hours subgroups. The path coefficient of intrapersonal sedentary leisure behaviour → productivity is stronger in Muslims than Christians whereas the path coefficient for interpersonal sedentary leisure behaviour → productivity is higher in Christians than Muslims. It can be inferred that the productivity of Muslims and Christians is highly triggered by intrapersonal sedentary leisure behaviour and interpersonal sedentary leisure behaviour, respectively. Similarly, the path coefficient for intrapersonal sedentary leisure behaviour → productivity is higher in regular full-time staff than regular part-time staff, but the path coefficient for interpersonal sedentary leisure behaviour

→ productivity is greater in regular part-time staff than regular full-time staff. This implies that regular full-time university staff's productivity is more contingent upon intrinsically induced sedentary leisure as compared with regular part-time staff whose productivity is highly triggered by interpersonal sedentary leisure behaviour.

IPMA addresses the essential areas for the enhancement of management operations. The IPMA findings allow the identification of factors with relatively high value and relatively low importance. For instance, our results demonstrate that intrapersonal sedentary leisure behaviour is of fundamental relevance for developing university staff's productivity. In other words, managers should notice that with one point rise in the performance of intrapersonal sedentary leisure behaviour, the performance of university staff's productivity is projected to grow by the value of the total effect (0.397). As a result, management initiatives aimed at increasing the productivity of university personnel should be concentrated on the intrapersonal sedentary leisure behaviour construct.

4.2 Limitations and Future Research Directions

Although this work has made a substantial contribution, there are some drawbacks. The fact that this was a cross-sectional survey of Ghanaian university staff is a major drawback of the research. As a result, concluding cause and effect from the data may be difficult. As a result, longitudinal surveys should be used in future research. Another limitation of the study is that the study concentrated on the direct relationship between sedentary leisure behaviour and university staff's productivity neglecting possible indirect effects. Future studies can address this relationship through proposed mediation effects. In addition, additional samples may be used to ground-test the study's suggested model. Multiple samples from other cultures or nations might give valuable insights into how these relationships are perceived by other cultures. As a final point, researchers may benefit from a mixed methodological approach, which combines both qualitative and quantitative methodologies.

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