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FOREWORD BY THE VICE CHANCELLOR

On behalf of Management of Kampala University, I wish to introduce to you our Scientific Research Journal (KUSRJ 2024). This publication is in pursuit of our university's mandate to conduct research and promote innovation.

Scientific research is critical to help us navigate our ever-changing world. Without it, we would have to rely on people's opinions, our intuitions and luck. Systematic scientific research offers us an objective understanding because scientific knowledge is grounded in objective and tangible science.

Further, publishing is the backbone of academic studies. It is the traditional means of disseminating research results, communicating new ideas and techniques. So we should not forget it in the academic arena. Journals provide a source of useful information and knowledge that can easily be located and read.

Therefore, I extend a vote of thanks to our students and staff who have highly contributed to this publication. On the same note, I highly commend our editorial team for their great efforts in reviewing the articles for publication.

I encourage all scholars to develop a culture of reading research papers in order to add to their existing knowledge and improve their overall understanding; to gain insight into the latest scientific techniques being used and the new development opportunities available; to create a rich repository of relevant reference; to develop critical thinking; and to build professional relationships and stronger networks among others.

Amb. Al Haj. Prof. Badru Dungu Kateregga.

FOUNDING VICE CHANCELLOR

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Physical Activity and Workplace Productivity: A Systematic Review

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Abstract

This study aimed to explore the relationship between physical activity and workplace productivity. The scope encompassed workplace initiatives, non-communicable diseases (NCDs), and socio-economic implications. It reviewed literature on the impact of physical activity on workplace productivity and NCD prevention, focusing on initiatives to reduce sedentary lifestyles in the workforce. Methodologically, a funnel approach was employed to review scholarly literature, including randomized and non-randomized studies on global trends sub-Saharan Africa, East Africa, and Uganda. The literature search strategy led to the screening of over 100,000 abstracts and titles, resulting in six studies being included for review after a quality check. These studies revealed correlations between sports participation and work performance, the impact of tailored physical exercise training on presenteeism and absenteeism, wellness management programs' effectiveness, and interventions to stimulate physical activity and relaxation among office workers. The research gap highlighted the scarcity of empirical evidence on physical activity and workplace productivity in sub-Saharan Africa, East Africa, and Uganda, with most existing studies focused on NCDs and workplace interventions to increase physical activity. The study highlights several effective workplace initiatives to support physical activity, including flexible schedules, exercise classes, walking meetings, gym facilities, charity walks/runs, and buddy exercise programs. Additionally, the study emphasizes the positive correlation between sports participation and work performance, as well as the effectiveness of individually tailored intelligent physical exercise training (IPET) and wellness management programs (WMP) in reducing absenteeism and increasing productivity. It also suggests that reducing work hours with or without mandatory physical exercise can positively affect productivity. Furthermore, the study recommends that managers should stimulate regular physical

activity among staff and establish practical plans to provide physical activities, especially among female staff.

Key words: Exercise, Physical Activity, Workplace Productivity, Non-Communicable Diseases, Systematic Review

1.0 Introduction

Adults typically work full-time, spending at least 8 hours a day, 5 days a week at their jobs. Many have reported not having leisure time for physical activity due to longer work hours and other responsibilities at home. However, implementing physical activity in the workplace can be feasible and effective without compromising work quality or quantity. This study aims to examine available literature and propose ways to improve health and productivity through workplace activity. The literature and case presented here can be used to inform policy and practices in the workplace. Finally, the study discusses a conceptual framework that's modeled on active and sedentary life styles as well as their resultant socio-economics effects. These are then utilized to provide guidelines for implementing workplace physical activity programs. (Bhutani et al., 2021) (Callow et al., 2020) (DiPietro et al., 2020) (Zhao et al., 2020).

1.1 Study Scope

The study broadly focused on workplace initiatives, prevention of Non-Communicable Diseases (NCDs) and the socio-economic (Ding, et al., 2016). Specifically, literature search was conducted on key parameters and assumptions that would unwrap the crux of physical activity and workplace productivity:

1. Active lifestyle prevents NCDs and also affects workplace productivity (Leischik, et al, 2015).
2. Relationship between physical activity and its possible effects on workplace productivity (Muluvhu, et al, 2020) (Igwesi-Chidobe, et al, 2018).
3. Relevant workplace initiative to reduce sedentary lifestyle in the workforce.
4. Level of workforce output.

1.2 Research Questions

The systematic review of literature was designed to explore the following research questions:

1. What is the effect of physical activity on non-communicable diseases?
2. What workplace initiatives are effective in supporting physical activity?
3. What is the link between physical activity and workplace productivity?

1.3 Physical Activity and Non-Communicable Diseases

Benefits of Physical Activity

Recent research has examined the relationship between physical activity and mental health in the workplace, with several studies showing a strong positive correlation between increased levels of physical activity and lower levels of depression and anxiety. It is suggested that reduced absenteeism, from work, due to mental health issues could be an important pathway by which increased physical activity may improve workplace productivity. A recent review has also highlighted the importance of considering the type and context of physical activity on mental health in the workplace, indicating that aerobic exercise and activities conducted during leisure time have more beneficial effects. The prominence of physically related health problems such as cardiovascular disease, obesity, and diabetes in the working population has led to an increased focus on the role of physical activity in the workplace for overall health promotion. It is also well known that regular participation in physical activity has a positive effect on the biological risk factors for these chronic diseases, such as improved glucose and insulin metabolism, regulation of blood pressure, and favorable changes in plasma lipids. Physical activity has been widely studied in terms of effectiveness in the prevention of chronic diseases. However, it is only in recent years that interest has emerged concerning the potential health benefits in the workplace. (Bhutani et al., 2021) (Callow et al., 2020) (DiPietro et al., 2020) (Greenwood-Hickman et al., 2021) (Woessner et al., 2021) (Zhao et al., 2020).

Physical Activity and Physical Health

Physical health is a precious resource which allows an individual to undertake activities of daily living and meet essential needs. Fitness, general health, and physical activity are all interrelated. Health is not only a result of certain fitness traits, but the relationship between the two is complex. There are several conceptual models of the relationship between physical activity and health. One model, the biomedical model, is the oldest. It proposes that there is a linear dose-response relation between cause (physical activity) and effect (health). This model is now considered oversimplified and quite outdated. The double positive model states that physical activity influences health by directly affecting body composition and function. It also has a positive effect on self-esteem through the effects of body image and general well-being. The model suggests that a more physically active lifestyle can be more resilient to age and stress-related disorders. From this model, it is understood that the effects of physical activity on health are multifaceted. Finally, the resource allocation theory proposes that the body has a fixed pool of energy it allocates between activity and biological systems. The theory predicts that increased activity will have a positive long- term effect of more energy and improved biological systems due to overspill from activity. (Kaur et al., 2020) (Hagedorn et al., 2022) (Agarwal et al., 2020)

Reduced Risk of Chronic Diseases

The term chronic disease encompasses a range of conditions that come on gradually and persist for long periods of time. Some of the most common and costly conditions in terms of morbidity and mortality are cardiovascular disease (CVD), cancer, chronic obstructive pulmonary disease (COPD), and diabetes. The literature is replete with evidence that regular physical activity can reduce the risk of these and other chronic conditions, but the focus here will be on these major conditions. The evidence for the positive effect of physical activity on CVD is strong. Inactivity is a comparable risk factor for CVD to smoking, and there is evidence that regular

physical activity can prevent the development of diabetes, a major risk factor and independent cause of CVD. The mechanism for the protective effects of activity on CVD is largely through its beneficial effects on reducing raised blood pressure, correcting dyslipidemia, reducing obesity, particularly abdominal obesity, and it also has a favorable effect on platelet and vascular function. High fitness levels can also reduce the risk of CVD, and the fitter a person is, the lower their risk. An ambitious statement from the AHA in 2003 was to eliminate death from CVD in people under 60 by 2020. It is only through widespread behavior change, primarily increases in physical activity, that this can be achieved. (Elshahat et al., 2021) (K. F. Morse et al. 2021) (Kaur et al., 2020)

Improved Energy Levels and Stamina

Poor physical fitness and the lack of physical activity can lead to an increased perception of effort for tasks that may seem routine as well as an increased feeling of fatigue. The increased perception of effort and the loss of stamina can be detrimental to an individual's productivity and performance as it will affect the speed and accuracy in which a task is performed. By addressing the link between fitness and increased stamina, it may be possible to offset fatigue and its effects in the workplace. This would be beneficial to an employer as an individual with higher energy levels and stamina would be more productive and make fewer errors. This would more than justify the time allocated for exercise in terms of the potential increase in output from employees. This was tested and proven in an experimental study to test the effects of jogging in a group of unfit sedentary adults. A 10-week program of exercise showed significant differences in the experimental group compared to a control group in aspects of fatigue. This can be taken as a useful indication to employers that if employees engage in fitness programs, they will be more productive during the time spent at their job. This could serve as a point to try to implement workplace fitness programs, which studies have shown to be very productive due to their convenience. (Rodríguez-Rey et al.2020).

1.4 Workplace Initiative and Physical Activity

Implementing Physical Activity Programs in the Workplace There are 5 steps to implement a workplace physical activity program. Steps include surveying employees, tailoring activities to their preferences, obtaining commitment from leaders and members, planning and executing activities, and evaluating the program. (Barkley et al., 2020) (Daly-Smith et al., 2020) (Fukushima et al., 2021) (Jacob et al., 2020) (Mon-López et al., 2020) (Parker et al., 2021) (Strain et al., 2020) (Van et al., 2021).

Creating a Culture of Movement

To promote movement at work, organizations should integrate physical activity into the workplace culture by creating supportive policies and environments. Engaging workers in the development of activity programs is crucial for success. Programs should be based on workers' interests and needs to make them more appealing. Creating a team-based approach or committee can increase participation and inclusivity. Incentives such as time off, prizes, and public recognition can further boost employee participation. Joining available Worksite Health Promotion provides useful resources for effective program implementation. (Aubert et al., 2022) (Benedetti et al., 2020) (Centeio et al., 2021) (Chanana &, 2021) (Holland et al., 2021) (Salvo et al., 2021) (Sundstrup et al., 2020) (Vilchez et al., 2021) (Yarberry and Sims, 2021).

Analyzing Access Opportunities for Fitness Venues

Access to exercise facilities is important for participation in physical activity. On-site facilities demonstrate commitment to health and influence employee behavior. A targeted recruitment approach led to a tenfold increase in program participation. Offering exercise facilities at work positively influences exercise habits. Evaluations of workplace interventions show increased physical activity and fitness levels. Perception of access to the facility is correlated with exercise levels. (Altman et al., 2023) (Béraud-Peigné et al., 2024)

(Ehrlich et al., 2023) (Gilles et al., 2021) (Jia et al., 2023) (Ransbotham et al., 2020) (Shao et al., 2022).

Encouraging Active Breaks and Movement throughout the Day A healthy mix of sitting and standing, combined with both physical and mental tasks, supports good cognitive performance, whereas a more physically inactive workstation work pattern has a detrimental effect on cognitive performance. A recent cross-sectional survey of over 2000 office workers in 7 different countries found that the cognitive performance of those workers who had the most inactive workstations was significantly lower than those with the most active workstations. Cognitive performance was measured with a careful series of computerized tests from the Cognitive Drug Research computerized assessment battery. The association remained strong and significant for both the overall cognitive performance z-score (global measure of cognitive function) and for 4 out of 6 specific cognitive domains, i.e., the inactive workstation group performed significantly worse across the tests of attention-switching, attention span, and speed of recall. There is a significant association between work patterns and spatial working memory. Age, gender, education, job type, and lifestyle did not remove the association between cognitive performance and work pattern. The more sedentary the work pattern, the worse the cognitive performance. Part-time workers and workers with a work-based injury or ailment did not have significantly different cognitive performance levels. Gender and age did not have a significant interaction effect. These results were consistent across all countries. ANCOVA with propensity score as a covariate was used to confirm the findings. (Altman et al., 2023) (Béraud-Peigné et al., 2024) (Dai et al., 2021) (Dobbin & Kalev, 2022) (Ehrlich et al., 2023) (Gilles et al., 2021) (Jia et al., 2023) (McCandless et al., 2022) (NASTACĂ et al., 2024)

(Swanagon & Simpson, 2023) (Wu, 2024).

Promoting Work-Life Balance and Flexibility

A key goal within today's high-performance and highly demanding work environments should be to promote a work-life balance. An appropriate balance between work and life is very important and can be influenced by workplace culture and the demands of the job. The reasoning behind this goal is a worker who puts in long hours on the job with minimum time left for their personal lives is unlikely to engage in regular physical activity. However, long working hours do not necessarily mean higher productivity. There is a point where working any more hours in the week will produce a decrease in productivity which will be counterproductive to the initial goal of getting more work done. It has been found that increasing working time from 40 to 50 hours in the week increases the amount of work done by 25%. However, increasing from 60 to 70 hours only adds an extra 5% of work done. This is equivalent to working 7 days a week at 10 hours a day being no more effective than working 6 days at 10 hours a day. Regular excessive hours can also lead to stress and fatigue, which are known to reduce mental capacity and concentration. By achieving an ideal work-life balance and limiting the work hours per week, maintaining a high level of productivity would be more feasible. This would be a much healthier lifestyle choice, and regular physical activity can play a big role in that. (Kang et al., 2024) (Lluch & Salvaj, 2022) (McCandless et al., 2022).

1.5 Physical Activity and Workplace Productivity

Importance of Workplace Productivity

Productivity has many benefits down the line, such as increased international competitiveness. It can prevent the loss of market share to imports and increased sales of exports. Products of other countries today are almost entirely judged by their price and quality. High productivity makes it possible to meet these goals. Finally, higher productivity can enable increased tax revenue for the government. If productivity increases throughout the economy, there is generally an

increase in profits. This results in a rise in tax collection due to increased income and business activity. This tax revenue can then be spent on many social goods while still maintaining a low tax burden. This has a favorable effect on the standard of living of its citizens. The importance of workplace productivity in society has been increasing due to global competition. There is now a higher focus on innovation and efficiency. Increased productivity in the workplace has many benefits. It is a major determinant of long-term growth and the level of real wages, and it is a foundation for the successful functioning of a country and its economy. The bottom line is that a country which is more productive is able to improve its standard of living. Greater productivity enables increased profits for businesses. This allows businesses to provide higher wages, increasing the standard of living. It also allows businesses to afford and expand, providing more jobs. These new jobs can be higher wage jobs in more prosperous communities. High productivity is a pathway to high growth – it makes it possible to increase economic growth as output can be achieved with fewer resources and time. This can lead to lower production costs and higher quality of goods. (Agarwal et al., 2020) (E. Centeio wt al., 2021) (Callow et al., 2020) (Woessner et al., 2021) (Zhao et al., 2020).

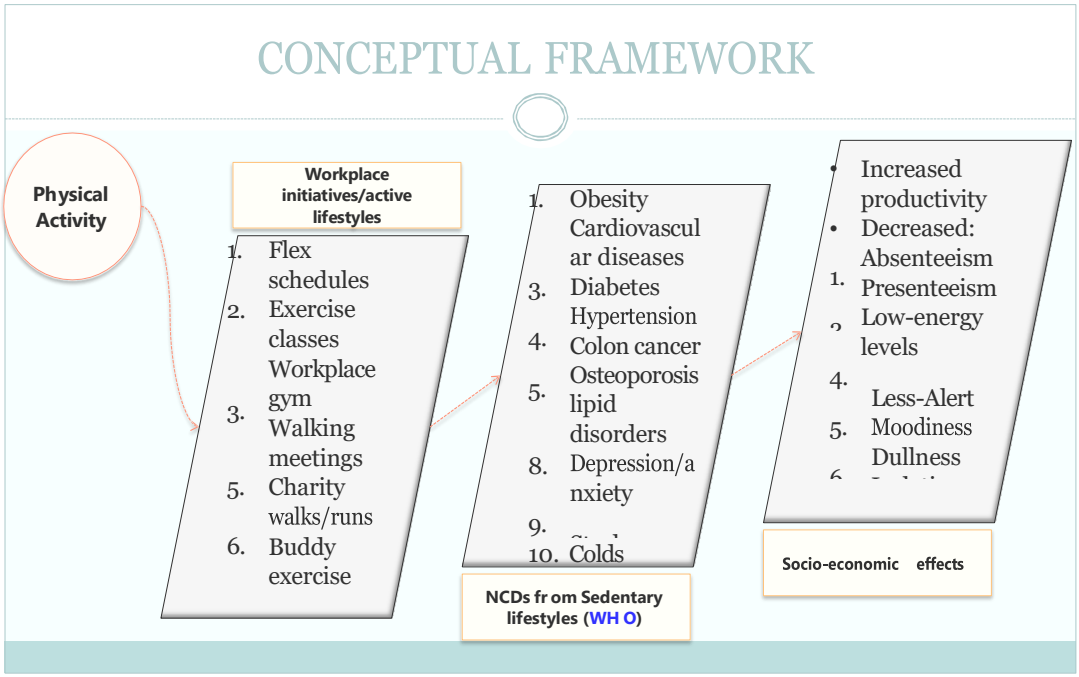
Decreased Absenteeism and Presenteeism

Studies show that improving physical health decreases absenteeism in the workplace. Physical activity is linked to fewer sick days in studies of civil servants and U.S. workers. Lack of physical activity and obesity are major contributors to sick days. Increasing exercise levels just once a week can reduce sick leave risk by 8%. Presenteeism, when employees work while not functioning at full capacity due to illness, causes greater productivity loss than absenteeism. Encouraging physical activity can benefit both employees with current health issues and prevent health problems in healthy individuals. (Baillot et al., 2021) (Dishman et al., 2021) (Leung, 2020) (Park et al., 2020) (Vizzotto et al., 2020) (Whiting et al., 2021).

1.6 CONCEPTUAL FRAMEWORK

The conceptual framework highlights the potential impact of physical activity (in form of workplace initiatives and active lifestyles) on preventing non-communicable diseases and how this has socio-economic effects. The physical activities may include exercise classes, workplace gym, and charity walk and/or runs. Non communicable diseases that are impacted by physical activities include obesity, cardiovascular diseases and hypertension. The socio-economic benefits include increased productivity and decreased absenteeism.

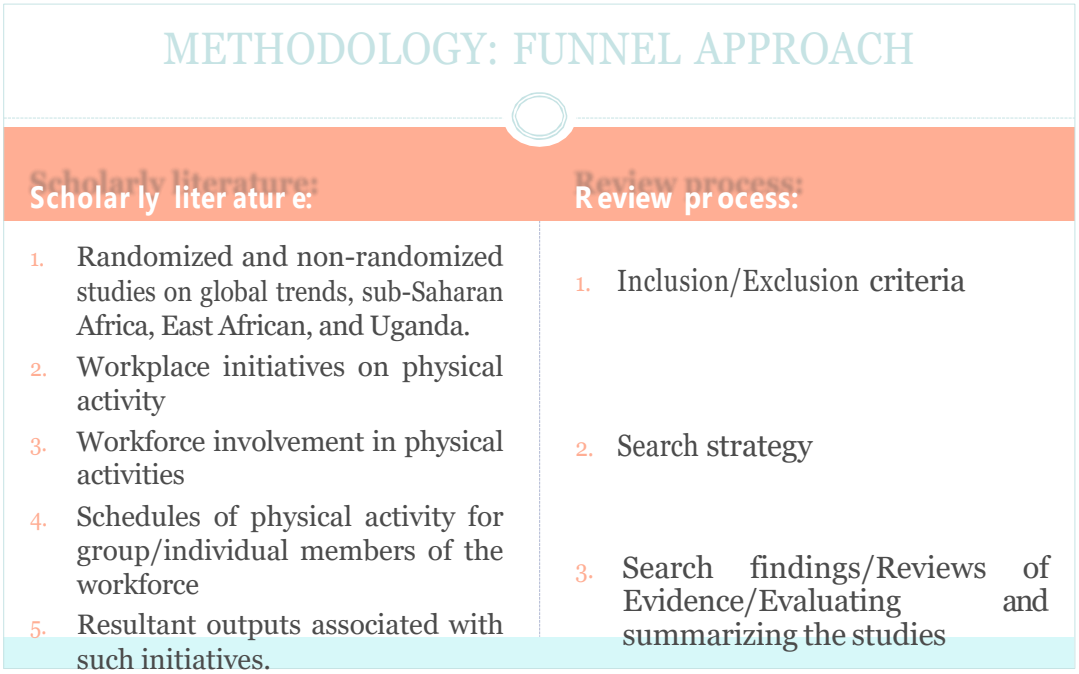
Table 1: Conceptual Framework



2.0 METHODOLOGY

This study employed the funnel approach to collect, assess, analyse and synthesis data from randomized and non-randomised studies on global trends, sub-Saharan Africa, East Africa and Uganda. A systematic review process was then applied with clearly stated inclusion and exclusion criteria, literature search strategy, search findings, reviews of evidence, evaluating and summarizing the studies. This methodology is well depicted on Table 2 below.

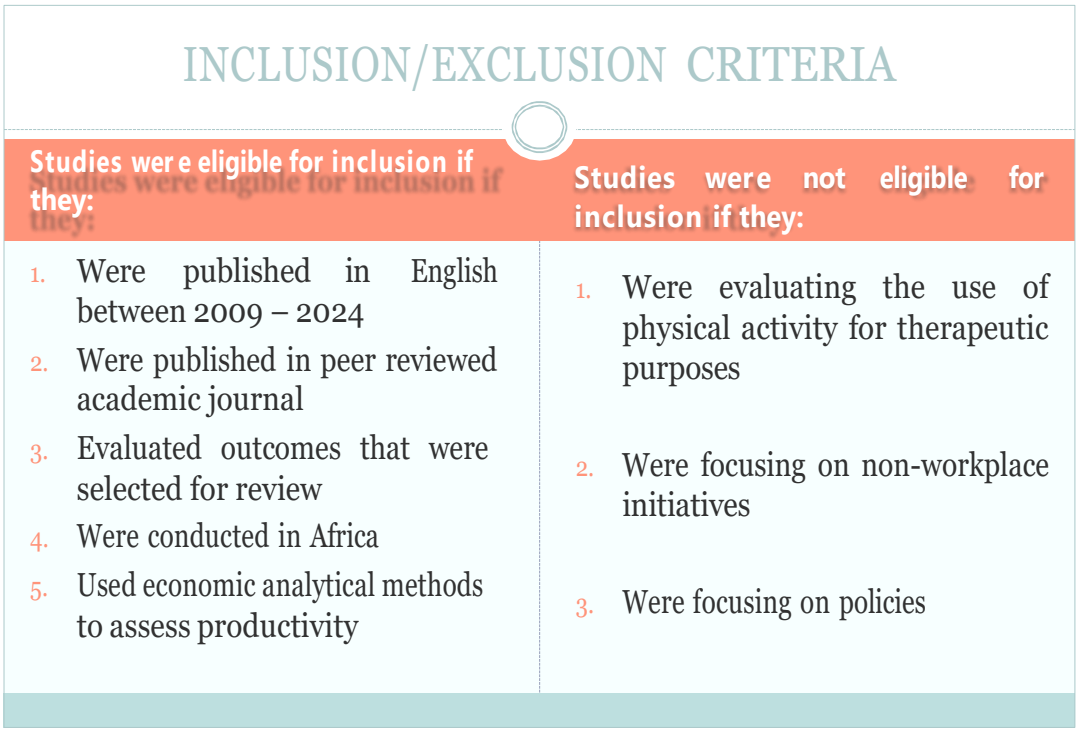
Table 2: Funnel Approach



Inclusion and Exclusion Criteria

Table 3 depicts the inclusion and exclusion criteria that were used to select the relevant literature for the systematic review.

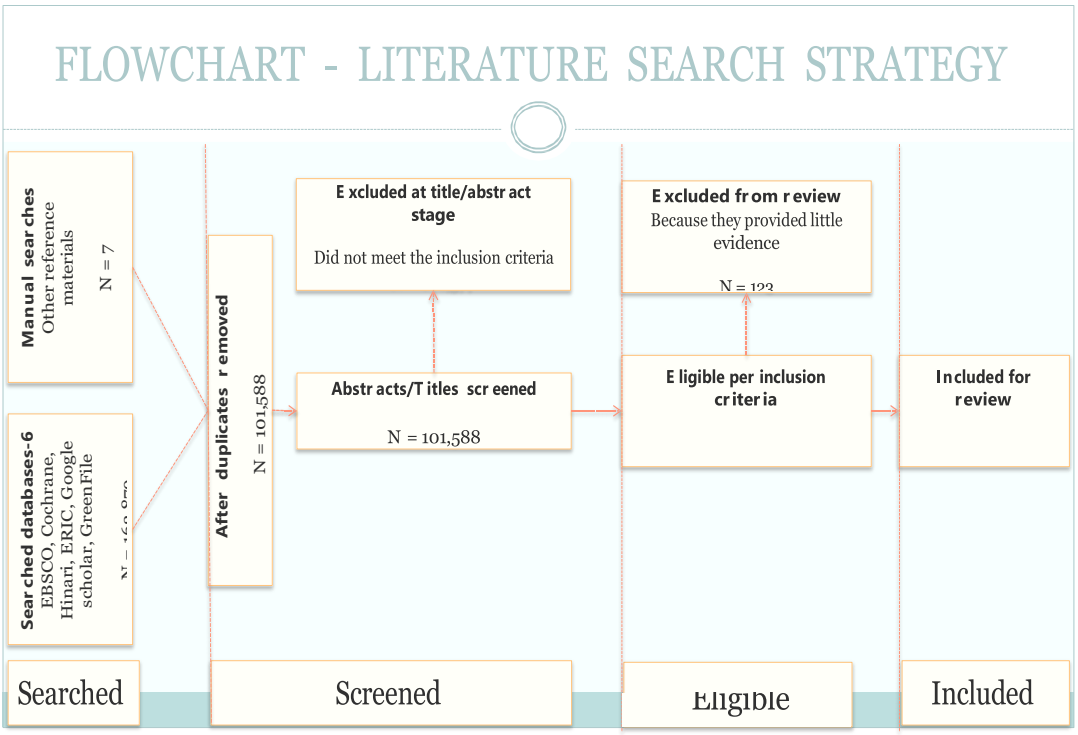
Table 3: Inclusion and Exclusion Criteria



Literature Search Strategy

This study utilised a 4-level literature search strategy. Over 160,000 literature were searched from reliable databases, these were then cleaned and screened for eligibility at title and abstract stages, titles and abstracts that were deemed eligible for review were then subjected to the inclusion and exclusion criteria. Table 4 is a flow chart that illustrates the 4-level strategy process undertaken to identify relevant information for the systematic review.

Table 4: Literature Search Flowchart

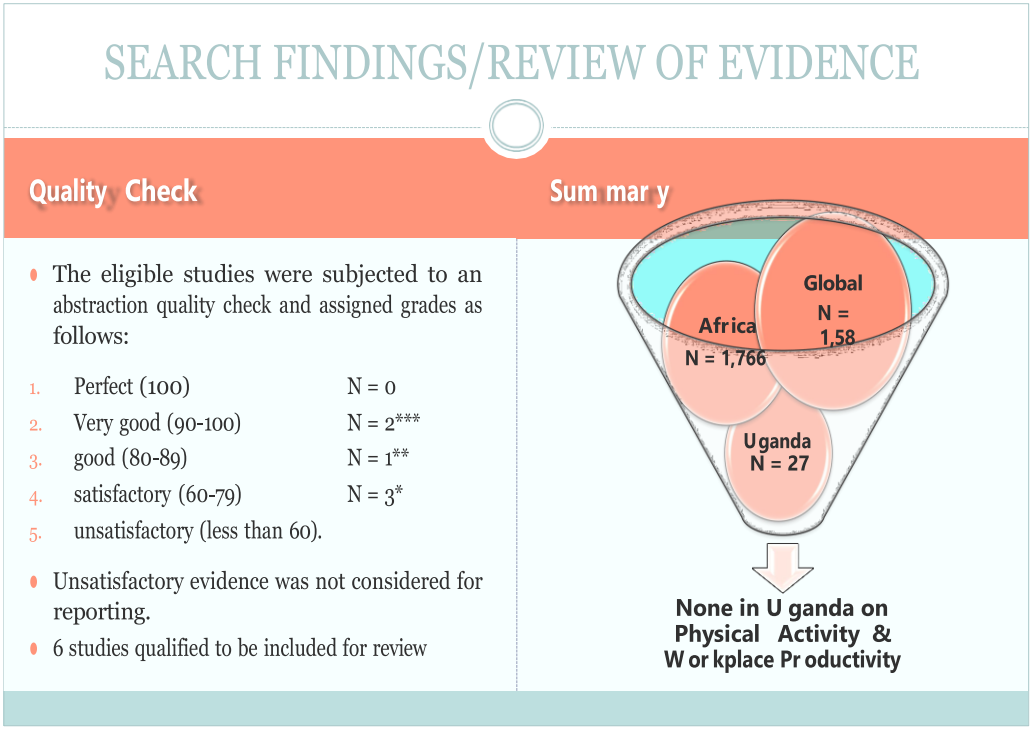


3.0 Search Findings

The literature search was subjected to an abstraction quality check of "Perfect - 100%", "Very Good - 90%", "Good – 89%", "Satisfactory - 79%", and "Unsatisfactory - <60%". Literature that were categorized as "Unsatisfactory" were not considered for review. 101,588 titles and/or abstracts were screened after removing duplicates and repetitions. 211 studies were deemed eligible for review, out of which, 123 were excluded after indepth review, because they provided little evidence for this study. Only six studies qualified and were included for review, out of the 88 studies that were deemed eligible for review, because they met the inclusion

criteria. Search findings further indicated that 1,766 studies were conducted in sub-Saharan African but only 27 studies were either about Uganda, in relation to the inclusion crite, or were conducted in Uganda. It's important to note that none of the 27 studies focused on Physical activity and workplace productivity in Uganda. This narrative is summarized in Table 5 below.

Table 5: Review of Evidence



The six studies, that qualified for inclusion, were then used as a proxy to the selected study criteria and considered adaptable to parameters that could be suitable for settings in sub-Saharan Africa, East Africa, and Uganda. Table 6, summarises the six studies that were analysed to explore the relationship between physical activity and workplace productivity. It captures names of the authors, study focus, study setting and/or country, methodology and design, study findings, conclusion and recommendations. All the six studies indicated a positive relationship between physical activity and workplace performance and productivity.

Table 6: Findings from Qualified Literature

S/No	Author(s)	Study focus	Setting/country	Methodology/design	Finding	Conclusions/recommendations
1.	Hashim, R., et al. (2011)*	Correlation between sports participation and work performance	40 staff of University Teknology MARA (UiTM), Malaysia	Cross-sectional survey design, stratified random sampling, bivariate analyses	Higher sports participation is associated with higher performance evaluation	UiTM should revise its policy that its 4,000 employees are more physical active
2.	Justesen, J.B., et al. (2017)***	Effect of individually tailored intelligent physical exercise training (IPET) on presenteeism and absenteeism among employees.	387 office workers, Denmark	1-year randomized controlled trail, training group-TG Vs control group-CG	TG exhibited a significant 4% increase in workability, 9% increase in general health, 6% increase in productivity, and a 29% reduction in absenteeism.	IPET combined with leisure-time physical activity significantly improved presenteeism and decreased absenteeism
3.	Kanjere, M., et al. 2014)*	Effectiveness of wellness management programmmes (WMP) on absenteeism	Department of agriculture in Capricorn district, Limpopo province, SA	Qualitative research design	WMP has benefits for employers and employees, it can contribute to high production	WMPs are necessary in a work place to combat absenteeism
4.	Koopmans, L., et al. (2014)*	Intervention to stimulate physical activity, relaxation of office workers and work performance	412 employees from 19 departments of a financial service provider, the Netherlands	RCT of individual work performance questionnaire (IWPQ) at baseline and 12 months follow-up	IWPQ showed statistically significant changes in IWP at baseline and follow-up	IWPQ scale s and changes on other constructs were in the expected direction
5.	Schwarz u, V.T., et al. (2011)**	How worksite health interventions, 2.5hr reduction of weekly working hours (RWH) with/without mandatory physical exercise (PE), affect productivity	177 employees in six dental health care workplaces, Sweden	Longitudinal examination of randomized study of workers' self rated productivity and workplace production levels	RWH showed the largest increase in productivity, PE showed significant increase in quantity of work; work-ability & decreased sickness absence.	A reduction in work hours may be used for health promotion activities with sustained or improved production levels
6.	Vatan, M.H., et al. (2017)**	Effect of 12-week physical activity on resilience, productivity and reducing staff absence	94 female staff of Islamic Azad university, Iran	Pretest-posttest quasi-experimental study designs, control and experimental groups	12-week physical activity had significant effect on resilience and staff productivity and reducing staff absence	Managers should stimulate regular PA to all staff in organizations and establish practical plans to provide physical activities especially among female staff

Research Gap

1. There is very limited body of empirical evidence on physical activity and its possible effects on workplace productivity in sub-Saharan Africa, East Africa and Uganda.
2. None of the studies included were from Uganda.
3. Most of the research was from the developed countries.
4. Most studies focused on the effect of physical activity and NCDs.
5. Most studies highlighted workplace interventions to increase physical activity.

Study Implications

1. This study points to the dire need for research on this phenomenon in Uganda.
2. Such systematic inquiry would inform policy on the importance of physical activity in preventing NCDs and increasing workplace productivity.
3. It would also help stakeholders in developing evidence-based interventions to support workplace initiatives in the prevention of NCDs.

4.0 CONCLUSION

This study systematically examined the literature on physical activity and workplace productivity. The literature indicated that there is a relationship between physical activity and improved employee health, especially on the prevention of non-communicable diseases, and this has a positive effect on workplace productivity and resultant socio-economic benefits. The study also indicated a lack of literature in Uganda on this phenomenon and the need for such studies.

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Physical Activity and Workplace Productivity in Uganda

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Abstract

This paper, a sequel to "Physical Activity and Workplace Productivity: A Systematic Review" (Rajab-Gyagenda, 2024), examined the relationship between workplace productivity and physical activity in Uganda. Despite the increasing demand for jobs and returns, workplace physical activity has not received much attention. It is argued that workplace physical activities have not been considered a significant factor in productivity, even though it is known that a healthy lifestyle leads to fewer doctor visits, less downtime, and improved productivity. This highlights the importance of physical health for all working groups in Uganda, regardless of their cultural and socio-economic status. The intensity of physical activities may vary among Ugandans, ranging from intense to mild, but the fact remains that it is not a routine activity in the workplace. The high costs associated with malnutrition and diseases in Uganda hinder the focus on physical activities. As a result, the nation's health capital is still low, raising questions about what exactly productivity entails in Uganda. Likewise, the emphasis on personal health for improved performance is lacking within workplaces. The researcher argues that productivity should be defined beyond the nation's GDP and take into account factors like teamwork, working conditions, work habits, and absenteeism, as is common in the Western Countries. This study reviewed literature on the relationship between physical activity and workplace productivity in Uganda, a developing country with its unique cultural and socio-economic landscape. The study acknowledges that physical activity can differ in nature and may not solely occur during leisure time or exercise, aligning with recent advancements in defining and measuring physical activity. While this study aims to improve work environment for Ugandans, its findings may also hold true for developing countries in general. The significance of the study is that it points to the need for employers to enhance physical activity opportunities for their workers for the long-term benefit of their businesses and the health of their employees. There is need for more studies in Uganda that objectively examine the relationship between physical activity and employee productivity.

Key words: Non-communicable diseases, Physical activity, Socio-economic, Workplace productivity, Uganda

1.0 INTRODUCTION

The macroeconomic impact of physical activity (PA) on a developing country is profound. Low-income countries tend to have a high prevalence of physically demanding jobs and a low life expectancy. The major concern for these countries is communicable disease, which has a vast impact on morbidity and mortality, inevitably diverting human and economic resources from productive activities. The double burden of disease is truly taking its toll on the least developed countries. Economic modelling has suggested a potential increase in the gross domestic product (GDP) of at least 15 billion dollars in 2010 to 30 billion in 2015 if the burden of illness was significantly reduced in low and middle-income countries. Simulation models in this data suggested that by achieving a 1% reduction in the relative risk of cardiovascular disease through a 10% reduction in physical inactivity, there would be 120,000 prevented deaths, which would add increased economic growth by an extra 180 billion dollars. There has been an increasing prevalence of non-communicable disease (NCD) in Uganda. It has been stated that by using the demographic projection model (DPM), the life expectancy at birth and at 60 years will increase by 13.2 years and
12.6 years, respectively from 2005 to 2050. The WHO global report in 2010 stated that the projected relative risk of premature death from the four main NCDs in Uganda was to increase by 50% between 2006 and 2015. This has the potential to substantially increase economic loss. Data on NCDs and the effect of Physical Activity on individual productivity is scarce in a low-income country context. Focusing on this data and providing relevant material from setting physical activity/health programs in low- income countries may increase policymakers' awareness of the importance of physical activity in the workplace and the potential to prevent the loss ofeconomic resources from NCDs.(Kazibwe et al., 2021) (Kostova et al.2020) (Schneider et al.2021) (Liu et al., 2022).

Importance of Workplace Productivity

The examination of workplace productivity holds significant importance as it directly influences the success or failure of an organization. As stated by Steers (1991), organizations must prioritize individual productivity as it has a direct impact on both group and organizational productivity. *Individual productivity* refers to the level of efficiency required to attain a specific objective. Typically, this efficiency level is measured by comparing the resources utilized to achieve a goal. If an individual can minimize the resources used to reach a goal, they can be deemed productive, and vice versa. There are numerous reasons why productivity is crucial for an organization: heightened employee productivity significantly affects revenue and costs. Increased productivity lowers production costs and raises revenue. To enhance profitability, organizations must strive to increase productivity as it allows for lower unit costs and higher unit sales. Consequently, this enables organizations to create more employment opportunities or pay higher wages. Additionally, high productivity positively impacts workforce morale. Enhanced productivity often results in reduced working hours, allowing employees to have a more relaxed schedule and reduced job demands. Furthermore, high productivity facilitates the expansion of businesses and enhances an organization's reputation. (Ganju et al.2020)

Role of Physical Activity in Workplace Productivity

This study does not seek to examine the direct impacts of physical activity on productivity, as it is widely known that physical activity is beneficial to health and that healthier workers are likely to be more productive. Instead, this study aims to examine the opportunities for physical activity during a working day in Uganda and the impact of participation in occupational and non-occupational physical activity on worker productivity.

Leisure time physical activity, which refers to physical activity outside of work, is commonly associated with exercise and encompasses activities such as sports and recreation. Decreased job-

related physical activity has been linked to decreased productivity, suggesting a negative relationship between the two. Optimal performance appears to occur in activities that require moderate levels of effort. A study conducted in Costa Rica supports this notion, revealing that workers engaged in low-energy jobs had higher productivity than those in high-energy jobs. However, absenteeism rates were the same, and there was a greater loss of work time. This finding underscores the importance of examining various forms of physical activity and their impact on productivity, highlighting that the effect on productivity may not solely be attributed to its impact on an individual's health.(Denis &Ndanyi, 2022) (Tulengerayo, 2022).

Despite the potentially detrimental outcomes associated with decreased physical activity during work, there has been an increasing concern regarding presenteeism in developed nations. *Presenteeism*, which can be defined as a decline in performance as a result of health issues or injuries, is an issue that is drawing more and more attention. It is quite astonishing to note that despite feeling unwell, many employees persist in working due to the fear of job loss or reduced income. This trend has been observed to be particularly prevalent in countries with a high occurrence of work- related injuries, raising questions about the impact of physically demanding jobs on presenteeism. Additionally, it also prompts us to ponder whether individuals with poor health have limited employment alternatives. This intertwining of factors suggests that certain types of physically demanding work can have a significantly adverse effect on both the well-being and productivity of workers, further emphasizing the importance of addressing presenteeism in the workplace. (Henderson & Smith, 2022)(Karanika-Murray & Biron, 2020)(Dobson et al.2020)(Coledam& da Silva, 2020)(Ruhle et al.2020)(Van, 2023)(Wang et al., 2023)(Pie et al.2020).

FACTORS AFFECTING PHYSICAL ACTIVITY IN UGANDA

The economic advancement of Uganda has brought about notable changes in the lifestyle of its community, giving rise to lifestyle

diseases. Efforts to encourage physical activity as a means of preventing these diseases have proven to be unsuccessful within the country. According to the background information, physical activity has been defined in various manners. However, the most comprehensive definition, utilized to emphasize the significance of promoting *physical activity*, stems from Caspersen and Powell (1985). They define it as "any movement performed by the body's skeletal muscles that results in energy expenditure." In other words, any action employing the skeletal muscles that expends energy can be considered physical activity, whether it be as simple as thinking or as strenuous as engaging in intense physical exercise. *Exercise*, on the other hand, is a subset of physical activity that is deliberately planned, structured, and repetitive, with the primary or intermediate aim of enhancing or sustaining physical fitness. Raising the level of physical activity may prove to be a viable approach for enhancing the overall health of the population; however, promoting this change is proving to be a challenging undertaking due to the multitude of factors that influence the behavior of the Ugandan community.(Ahaibwe et al., 2021) (Alkhatib et al., 2021)(Ndejjo et al., 2020)(Mackay, 2022)(Musoke et al., 2021)(Ndejjo et al., 2023).

An important aspect to consider in the promotion of physical activity in Uganda is the cultural outlook. The Western perspective of health promotion through physical activity does not hold relevance in a country that is still grappling with meeting its population's basic needs. The slogan "80% by the year 2000" was embraced by Western nations in an attempt to enhance the health of their communities. This goal is aimed at getting 80% of the population to partake in an activity that would burn 300 Kcal of energy per week. However, this slogan is not feasible for Ugandans. Ugandans view physical activity as work, not for health or fitness enhancement. Recreation is limited due to challenging living conditions.Given the distinct perception of physical activity, health promotion campaigns need to be tailor-made to effectively convey their objectives. A wide array of strategies must be employed to

transform behavior and attitudes across the entire population, although measuring the success of each strategy can be a daunting task. (Yaya et al., 2020)(Seymour et al., 2020).

Socio-economic Factors

The shift to sedentary jobs in Low and Middle-Income Countries (LMICs), including Uganda, due to the process of industrialization and energetic transitions, is leading to a noticeable decrease in physical activity and a significant decline in the overall health of the workforce. Moreover, the productivity of workers is also being severely affected as energy-saving technologies are gradually replacing manual labor. It is important to note that higher socio-economic status is now increasingly associated with engaging in more sedentary work, which poses considerable challenges for individuals in LMICs who were previously engaged in labor- intensive occupations. Additionally, the impact of HIV/AIDS further exacerbates the issue of workplace productivity, particularly in sectors such as industry and agriculture. The increasing production costs and declining profits in these sectors are directly linked to the escalating rates of sickness and mortality, which significantly hinder overall productivity. It is crucial to emphasize the importance of physical activity in relation to productivity, especially when compared to worker health. By prioritizing physical activity, it is possible to enhance both the productivity and well-being of the workforce, thereby addressing the challenges faced by LMICs in a comprehensive manner. (Kwizera et al., 2023)

Cultural Factors

One crucial element to consider in this study is the influence of culture. Culture shapes individuals' behavior and choices in society, impacting their physical activity levels. Traditional beliefs and religious influences have marginalized women in Ugandan society, leading to a lack of physical activity. Embracing Western culture increases women's likelihood of being active, but they still face time constraints and traditional roles. Research has shown that 18.5% of Ugandans are inactive, with women making up the majority of this

group. This connection between physical activity, gender, and social class hinders women's participation. Essentially, cultural norms in Uganda make it challenging for many women to participate in physical activity. Addressing this cultural issue is vital for promoting women's physical activity and improving overall health outcomes for future generations, considering that today's young girls will become tomorrow's women. Resolving this cultural issue may be the key to promoting increased physical activity among women and ultimately improving overall health outcomes through lifestyle modifications.

Accessibility to Factors

In urban areas, the majority (58.9%) lacked physical activity facilities at workplaces compared to rural areas (21.1%). Urban workers primarily engaged in walking (20.6%) and standing (21.6%). Only a small percentage (8.9% walking, 1.7% cycling) commuted by walking or cycling. Rural workers had higher percentages, with 12.5% walking and 3.1% cycling. On average, 5.4% of urban and 6.6% of rural workers participated in vigorous- intensity work-related activities. A majority (88.1%) of urban workers and a slightly higher proportion of rural workers (92.6%) considered physical activity important. This discrepancy may be correlated to the individual's perception of the importance of physical activity, and it could also be influenced by the higher percentage of traditional workers in rural areas. Some workers prioritized income over physical activity. Population growth and urbanization have increased the importance of physical activity, with governments implementing initiatives. While access to exercise facilities is not a major factor affecting physical activity in Uganda, it is worth considering in rural villages. More exercise facilities could increase physical activity, and traditional work health benefits should not be neglected.(Abdul et al.2021) (Amuzie et al., 2022)(Zhang et al., 2022).

BENEFITS OF PHYSICAL ACTIVITY ON WORKPLACE PRODUCTIVITY

There are multiple approaches by which engaging in physical activity can enhance work performance. These approaches encompass heightened concentration, prioritization of tasks, and the ability to think critically. The reason behind this lies in the fact that individuals who are physically active exhibit superior cognitive function compared to their sedentary counterparts. It is suggested that engaging in moderate to intense physical activity accelerates the brain's information processing speed, which serves as the foundation for cognitive function. Consequently, this enables individuals to make better instantaneous decisions and ultimately leads to an improvement in work performance. Furthermore, it has been proposed that the positive impact of exercise on mood is correlated with enhanced cognitive function. Alongside these cognitive benefits, physical activity also directly affects work performance by reducing absenteeism, diminishing staff turnover, and enhancing on- the-job decision making. This is of utmost importance as it signifies that physical activity intervention programs in Uganda can be implemented more easily, due to the various ways in which physical activity can enhance productivity. (Heinze et al., 2021)(Vancampfort et al., 2020) (Relacion, 2023) (Ikosiot, 2023).

Improved Physical Health

Physical activity has been a strong interest in improved health from earlier times. The American College of Sports Medicine and the Center for Disease Control have identified the major strength and health gains from regular physical activity. Regular physical activity has numerous health benefits including reducing the risk of premature death, improving coordination, lowering the risk of diabetes and high blood pressure, maintaining a healthy weight, and managing weight. It also strengthens muscles, bones, and joints, reduces depression and anxiety, improves psychological well-being, enhances performance in work and sports, and may increase lifespan. Overall, being physically active can improve work performance and productivity, especially for manual labor workers, and even individuals with illnesses or diseases can benefit from increased

engagement in productivity. When a person is absent at work, productivity is lost. This leads to excess free time where unhealthy behaviors can occur. The worker may also lack motivation to return, resulting in a loss of skills and impaired performance. This can impact income and job stability. Evidence shows that physical activity plays a crucial role in improving health and productivity for skilled workers. Engaging in regular physical activity can reduce absenteeism by enhancing bodily efficiency. For example, those who are more active have fewer infection symptoms and less time off work. A more efficient system results in less fatigue and higher morale. Overall, physical activity greatly improves health and work performance regardless of the job type.(Fukushima et al., 2021)(Lusa et al., 2020)(Patel et al., 2022)(Priya et al., 2023)(Sfandyari et al., 2020).

Enhanced Mental Well-being

Constraints to work teams in Uganda include low morale, illness, and alcohol abuse. Mental well-being, particularly cognitive and emotional aspects of the psychological well-being (PWB), has been studied in relation to exercise. One study (Oaten and Cheng, 2006on 29 sedentary young adults) found that aerobic exercise reduced negative mood and stress levels in sedentary young adults. While Higgins (2016) conducted a randomized trial involving 156 adults with Major Depressive Disorder (MDD) and found that 12 weeks of moderate-intensity aerobic exercise led to a noteworthy decrease in depressive symptoms. A UK-based study also found a link between exercise and improved work performance through enhanced mental health. (Bond et al.2020) (Gaia et al., 2022) (Hassan et al.,2023) (Herbert, 2022) (Herbert et al., 2020) (Johnston et al. 2021) (Uddin et al., 2020) (Yoon et al., 2023).

Increased Focus and Concentration

Regular physical activity has been proven to improve focus and concentration at work, as well as enhance mental performance. Studies have shown that both long-term exercise programs and short-term aerobic exercise can have positive effects on cognitive performance. A comprehensive analysis of 18 studies between 1996

and 2001found that fitness training significantly improved cognitive abilities of individuals aged 55-80, with those who participated in training outperforming control groups by 0.4 Standard Deviations (SD). Higher fitness levels were also associated with higher performance levels. Implementing a physical activity program in Uganda, a country with low reported physical activity, could potentially enhance cognitive capacity and improve labor productivity. Another study found that engaging in physical activity improved mental clarity and concentration, leading to improved job performance. The benefits of increased cognitive performance were not limited to exercise sessions, but extended to work tasks performed outside of the program. This suggests that continued physical activity can boost cognitive function and overall work productivity. Clear thinking, focused effort, and task performance are closely connected, making cognitive performance crucial for productivity. (Heinze et al.2021)(Johnson, 2022)(McCurdy et al.,2020) (Quialheiro et al.2022)(Thomas & Charles, 2022) (Vancampfort et al.2021).

Reduced Absenteeism and Presenteeism

Absenteeism and presenteeism are two important terms to define. *Absenteeism* refers to being absent from work, which negatively affects productivity. *Presenteeism* occurs when employees come to work despite being unwell, causing decreased output and distractions. Both can impact workplace productivity, especially in low-income countries. Studies show that physical activity can reduce absenteeism and presenteeism. One study demonstrated that exercise had a significant impact on reducing sickness presenteeism (-1.1 times/week, p=0.008) and, after one year, also had a significant effect on reducing the number of sick days. The study focused on sedentary call-center workers and found that exercise significantly reduced sickness presenteeism and sick days. Another study by van den Heuvel (2004) on randomized controlled trial aimed to assess the effectiveness of a back pain prevention program in a work setting, found that high fitness levels reduced sick leave due to back pain. These findings support the idea that exercise can enhance capabilities and modify behaviors and beliefs. (Aronsson et al., 2021)(Hervieux et al., 2023)(Hunter et al., 2021)(Jeong et

al.,2020)(Lusa et al.,2020) (O'Malley, 2021)(Petrovčič et al., 2022)(Ribas et al.,2020)(Santos and Miragaia, 2023)(Tarro et al.2020).

Amplified Financial Gains

Companies invest in assets to maximize profits and expand operations. To achieve a higher return on investment in employee physical activity, an analytical approach is necessary. Investing in factors that encourage increased physical activity among employees should lead to an overall increase in the labor supply. Moreover, investing in raising public awareness about the benefits of physical activity and the drawbacks of a sedentary lifestyle requires time to influence behavior, especially among at-risk groups. These educational interventions will increase the opportunity cost of leisure and the costs associated with inactivity. These effects will primarily affect the labor force through the income effect and, if successful, result in an increase in labor supply. Consequently, the entire labor supply curve will shift outward. Since the investment has not caused actual changes in wages, the increase in activity will simply lead to a movement along the supply curve. The wage elasticity of supply is crucial in this scenario. If it is high, even a slight increase in wages will prompt workers to increase their activity levels, which is desirable for employers. In such a situation, profitability is likely to rise due to the higher labor supply, even with an unchanged wage rate. (Cindiyasari et al., 2022) (Farooq et al., 2021)(Ge and Xu, 2021).

STRATEGIES TO PROMOTE PHYSICAL ACTIVITY IN THE WORKPLACE

The workplace is an important setting for physical activity, as many adults spend a significant amount of their waking hours there. However, there has been limited exploration of promoting physical activity in the workplace. This study investigates attitudes and practices of workplace physical activity. The results show that individuals with white-collar occupations engage in less non- exercise activities compared to those in manual labor occupations.

Barriers to physical activity in the workplace include time pressures, fatigue, and a lack of resources and facilities. For instance, a recent review of qualitative research in the UK revealed that office workers often feel restricted due to a lack of feasible opportunities for physical activity during their working hours. Specifically, these workers expressed that they would be open to taking short active breaks if provided with viable options. An office worker in a Swedish study aptly described this situation by stating, "it needs to be easy to make the right choice," referring to the choice of breaking up sedentary time with physical activity. This sentiment aligns with social ecological models of behavior, which emphasize the importance of enhancing self-efficacy and offering environmental opportunities to promote behavior change. (Bukhsh et al., 2020) (Herrod et al., 2021) (Metcalfe et al., 2020) (Reid et al.2022).

Creating a Supportive Environment

Creating a supportive workplace environment is crucial for promoting behavioral changes in health. Both the physical and cultural aspects of the workplace play a role in influencing employee health. Companies that prioritize employee retention and long-term health tend to have better health outcomes and reduced sick days. A supportive environment can be nurtured through employee participation in decision-making processes, teamwork, and a strong social support network. Tailoring interventions to the specific workplace and implementing changes such as creating resource centers, increasing access to stairs, and using point of decision prompts can effectively encourage healthier behaviors. Monitoring and follow-up assessments are important to ensure the effectiveness of these changes.(Sorn et al., 2023) (Szabó and Kajos, 2024).

Offering Incentives and Rewards

Offering incentives provides individuals with motivation to start a task and finish it. Incentives persuade people to dedicate more time to their workout program. The rewards can be non-monetary, such as a company-branded item or free nutritious meals. A study,

conducted in the United States, showed that 64% of employees would take better care of themselves if their employer offered a cash incentive. Another survey conducted in Australia revealed that 63% of individuals considered rewards to be very important or significant in their involvement in employment-based health promotion programs. Random rewards generate more enthusiasm than predetermined ones. They create uncertainty and encourage individuals to continue working diligently. A monthly raffle where exercise session attendees receive a ticket is a practical example of a random reward strategy.The names of 4-6 individuals can be drawn, and those who did not win can preserve their tickets for the next raffle. This strategy maintains individuals' interest with a slight probability of receiving a reward each month.(Colvin et al., 2021) (MacLeod &Urquiola, 2021)(Ravenelle et al., 2021) (Vonasch et al., 2024). (Vuong& Nguyen, 2022).

Providing Accessible Exercise Opportunities

In order to encourage consistent participation, it is important to customize physical activity to suit each person's individual requirements, preferences, and daily routines. Nonetheless, efforts to promote exercise in the workplace typically focus on group interventions, which may not be appealing to everyone. Employers should be prompted to adopt more innovative methods by employing a blend of individual and organizational strategies to enhance accessibility to exercise for a larger number of their staff members.

At the individual level, it is important to implement strategies that assist employees in incorporating exercise into their daily lives, whether it be during work hours or outside of them. This is particularly crucial as the perception of limited time is a significant factor contributing to the lack of physical activity among working adults. Organizations can consider offering seminars on time management or work-life balance, integrating exercise breaks into employee schedules, or motivating individuals to utilize their lunch or coffee breaks for engaging in physical activities.

Given that poverty often acts as an obstacle to physical activity, especially in developing nations, it is crucial to devise cost-effective strategies that can promote exercise among employees with low-paying jobs. One approach is to offer incentives for physical activity, such as monetary rewards or reduced health insurance premiums, to those employees who achieve specific exercise goals. Another effective method is to sponsor company teams for events like races and walks, or alternatively, provide subsidized exercise classes. Furthermore, providing educational resources and materials that explain where and how to engage in physical activity, as well as the optimal types and amounts of activity for various health outcomes, can greatly benefit employees who lack a strong understanding of these concepts.

CONCLUSION

This study explored the relationship between physical activity and workplace productivity in Uganda. The literature points to significant advantages for promoting physical activity and its impact on employee productivity. Quantitative studies on Uganda are sparce and the country's cultural norms and economic status indicate that cut and paste physical activities from the West may not be possible in Uganda. However, there is need for Ugandan employers to provide opportunities for their workers to be physically active. There is also great need in Uganda for more objective studies examining this relationship and exploring different physical activities and their relative impact on productivity.

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