

# Workplace Ergonomics and Employee Productivity of Manufacturing Firms in Eldoret City County, Kenya

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**Abstract:** The purpose of the study was to determine the effect of workplace ergonomics on employee productivity in manufacturing firms in Kenya. The study adopted the following theory, domino theory the study applied a cross sectional research design. The target population of the study was all heads of departments of 18 manufacturing firms in Eldoret City. The study worked with entire population since the target population is small. The main data collection instruments was questionnaires. Pilot study was carried out to test the reliability and validity of the data collection instrument. Descriptive statistics data analysis method was applied to analyze data aided by Statistical Package for Social Sciences (SPSS) to compute responses frequencies, percentage mean and standard deviation results. Finally Multiple Linear Regression model was employed to establish the significance of the independent variables on the dependent variable. Based on the findings, the study concluded that firm's ergonomics has significant effect on employee productivity in manufacturing firms in Kenya. The study came up with the following recommendations; the management of the manufacturing firms should be able to improve on the ways they handle risks. The management should employ equipment's to take care of emergencies in reduction of accidents.

**Keywords:** Workplace ergonomics, employee productivity.

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## 1. INTRODUCTION

Organizations rely on employees to function and meet the set objectives. They, therefore, use resources to sustain and maintain a productive workforce. Inadequate workplace safety may inhibit employee productivity (European employee productivity institute, 2019). Current issues such as globalization, legal requirements, and technological revolution have significant implications on organizational management: changing work, workforce and workplaces, safety concerns, and consequently greater workforce expectations. Workplaces have become more complex and safety-prone (Keraka, 2020). These changes could be affecting the productivity of the employees. Moreover, as recorded by Obrenovic et al. (2020), workplace safety programmes adopted by organisations may not be adequate for protecting employees from modern workplace job hazards, which may hinder their productivity. In addition (Gupta et al., 2016) and Bayram (2022) opine that new technologies expose employees to new safety risks, while globalization has led to a diverse workforce with diverse safety attitudes. Literature by Al Mazrouei et al. (2019) and Saleem et al. (2021) notes that recent interests are shifting towards adopting safety programmes that fully protect employees enabling productivity at work. Extant literature (Ndegwa et al., 2022); Malavi et al. (2021) has further noted that adopting such programmes is low, slow, and not supported by productivity considerations, as there needs to be more empirical evidence showing their impact on employee productivity.

All firms face safety challenges, yet employees require optimal safety to be productive (Society for Human Resource Management, 2023). Therefore, organizations require appropriate programmes to cover all possible contingencies without interrupting normal work operations. Despite observations in business firms pointing out that workplace safety programmes may have influenced employee productivity, there lacks conclusive empirical evidence. Hakiza (2022) argues that poor OHS practices harm workers and lead to financial losses for businesses. For instance, Goetzel (2018) observes that when Cicna insurance company and Acco Corp in the United States offered insurance compensation packages, protective clothing, working postures training, safety consulting, and onsite medical attention, their employees became more productive; no lost workday cases, no cases of restricted work, and employees had positive risk attitudes. A study by Ravindran (2021) noted that firms without workplace safety programmes might suffer from increased absenteeism and error cases, decreased bids for more work, and workers are less motivated in their work. Extant studies have not evaluated workplace safety programmes with employee productivity measured by productive time, task accomplishment, and value-added.

There are several international guidelines for ensuring successful workplace safety for any institution: The national occupational safety association (NOSA) (2017) system, the ILCI (2015), the international safety rating system (2016), International Labour Organization's (ILO) guidelines on occupational safety (2018), ISO:31000:2009 safety risk management standard, the three Es of safety (engineering, education, enforcement) advocated by Heinrich (1998). All these international guidelines posit that effective safety management should address ergonomics, emergency management, safety training, and safety transfer. If these four areas are addressed, a safe workplace will be accomplished, and consequently, better employee productivity is expected (Heinrich, 2017). There needs to be more empirical evidence on the extent to which these safety programmes influence employee value-added, accomplishment of tasks, and productive time. This study was intended to provide empirical insights into the effect of these safety programmes on employees' productivity in manufacturing firms in Kenya.

Workplace safety ergonomics improve workplace safety through the detection and elimination of hazards. Hulme et al. (2022) posit that workplace safety ergonomics reduce the risk factors that lead to injuries, ensuring employees' optimal productivity is not interfered. Capodaglio's (2022) study adds that workplace safety ergonomics are expected to improve work activity comfort and reduce safety injuries and fatigue, ensuring employees accomplish their work tasks fully. Inadequate workplace safety ergonomics exposes employees to injury and rapid fatigue, and this may lead to productivity losses (Ravindran, 2021). Despite previous research consistently identifying ergonomics as a strategy to boost work safety and employee productivity, they have been faulted in four areas; firstly, the studies have not evaluated the three indicators of workplace safety ergonomics (hazard detectors, protective devices, and effects analysis) against employee productivity. For instance, Leber et al. (2018) investigated the impact of protective ergonomics on work efficiency for persons with disability; Ravindran (2021) investigated the impact of hazard ergonomics on work performance while Sinno et al. (2020) and Pickson et al. (2017) focused on recognition of symptoms of overexposure and employee wellness. Second, the methodological rigor applied by previous studies did not conclusively establish the link between safety ergonomics and employee productivity; Chintada and Umasankar (2022) was a case study and used subjective measures, and Bayram (2022) did a critical literature review and therefore failed to generate original findings, while Leber et al. (2022) analyzed data using frequencies and percentages. Third, previous literature is anchored on different industries, firms, and countries; therefore, have a minimal application to manufacturing firms in a developing nation. Fourth, previous studies and extant theoretical frameworks have yet to relate workplace safety ergonomics with employee productivity measured by productive time, degree of accomplishment of tasks, and value-added.

Safety training educates employees on safe working and the identification of exposures (Mora et al., 2020).

Previous studies by Alonso et al. (2018) and Malavi et al. (2021) have noted that many manufacturing firms in Kenya still need to comply with the safety training standards fully. The studies have noted that despite safety training guidelines such as safety seminars, safety manuals, safety rules and procedures, safety drills, and regular briefs, many manufacturing firms in Kenya still need to comply with the programmes (M. G., Alphonse & E., Rulinda. 2025). Previous literature has identified safety training as an innovative way to boost employee productivity. A study by Ravindran (2021) posits that workplace safety-trained employees become sufficiently fit to perform tasks confidently, while a safety and productivity culture can be developed through formal training programmes. A study by Huang et al. (2022) noted that safety training enables workers to identify safety risks and communicate corrective action early enough; this can prevent the onset of productivity costs. Grabowski (2019) notes that safety training ensures desirable safety behaviors among employees, such as safe working and

avoiding severe errors. A study by Malavi et al. (2021) adds that workplace safety training gives employees the confidence to concentrate on their tasks without unnecessary phobias, especially in safety-prone workplaces such as manufacturing. Therefore, safety training accompanied by proper protection is expected to improve employees' productivity significantly; however, extant literature has yet to establish this.

The current study departs from extant literature on the effect of workplace safety training on employee productivity in four ways. First, empirical evidence needs to be more conclusive on the effect of workplace safety training on employee productivity; some studies have contradicting findings; for instance, Bayram (2022) and Ravindran (2021) suggested that safety training influences positive culture but does not influence employee productivity, while Obong et al. (2021) suggested that workplace safety training positively influences employee efficiency and confidence at work. Secondly, prior studies did not assess the effect of safety training on productive time, task accomplishment, and employee value added. For example, Aluoch (2015) used employee perceptions of safety; Rosa (2019) checked company loyalty by employees, and Laura (2019) used employee turnover intentions. Third, each of these studies measured employee productivity differently. Fourth, existing literature has focused on worker safety awareness (Adim & Mezeh, 2020; Alonso et al., 2018; Aluoch, 2015; Malavi et al., 2021; Ravindran, 2021; Sawe et al., 2013) and largely ignored the existing safety training programmes put in place in organizations as posited by theoretical perspectives by Heinrich domino theory (1931). Therefore extant empirical studies measured workplace safety training in terms of ex-ante perspective instead of safety interventions put in place for safety and productivity; these measures could have led to mistaken inferences. The current study filled these research gaps.

Proactive emergency management is now a global concern since adverse risks still occur despite the level of protection in place. Workplace safety emergency management reduces the extent of workers' disabilities and work disruption and potentially can lower employee productivity losses (Alphonse, M. G. & Rulinda, E. 2025). Prior studies by Drake et al. (2018) and Reese (2018) have provided an understanding of the nature of a manufacturing sector workplace and have observed that workplace safety incidents are disruptive and could lead to employee productivity losses. Further studies by Alariki and Al-Abed (2021) and Obrenovic et al. (2020) have pointed out that the problem of employee productivity could be due to defective management of workplace safety emergencies. A study by Leonhardsen et al. (2022) has provided a guideline for effective emergency management, including setting out rescue response and evacuation plans, emergency equipment and medical care, conspicuous display of emergency contacts, safe assembly and exit points, emergency logs, and documentation. Prior literature needs to evaluate these programs' effect on employee productivity adequately. Five aspects of extant literature have been faulted. First, the studies have not established the link between manufacturing firms' workplace emergency management and employees' productive time, degree of accomplishment of tasks, and value-added. Second, prior studies by Wilson (2020) and Keraka (2020) did not examine organizations' specific emergency management strategies. However, they focused on ex-ante perspectives and employee awareness, which could have led to mistaken inferences. As posited by the tip of the iceberg theory by McClelland (2000) that simple incidences which go unreported by employers could significantly affect employees' productivity where inadequate emergency equipment are lacking. Further, employees' awareness of their responsibility in case of loss does not guarantee effective emergency management in case programmes such as first aid kits and other emergency equipment are lacking (Alphonse, M. G. & Rulinda, E. 2025).

Third, the studies by Obrenovic et al. (2020) and Young (2014) have employed mainly qualitative methodology; Fourth, most studies conducted in different contexts have produced contradictory findings; for instance, Adjotor (2013) found that safety emergency programmes reduce the costs associated with illness but do not affect employee productivity while Cudjoe's (2017) and Obrenovic et al. (2020) associated emergency programmes with positive employee productivity outcomes. Finally, theoretical frameworks still need to provide an understanding of how emergency management influences employee productivity. Further, unlike extant studies, the current study used Heinrich's postulates of the domino theory (1931), which emphasizes safety programmes but does not indicate organizational outcomes derived from proper safety programmes. Therefore, the current study is expected to contribute to developing the theory and existing repository of literature on workplace safety and productivity.

Workplace safety transfer to consultants and insurance companies assures the organization of its safety, improves employee morale and company pride, and reduces suffering by injured employees (Reese, 2018). Workplace safety incidents put a significant financial and psychological burden on employees, which could affect their work productivity (International Labour Organization, 2018). Previous studies by Kurdy et al. (2021) and Gubler et al. (2022) add that workplace safety

transfer reduces the financial and psychological burden associated with work incidents; hence employees are expected to be optimally productive without worrying about safety incidents. Reports by International Labour Organization (2018), Osha African Report (2019), and literature by Reese (2018) have noted that the incident prone manufacturing workplace has recently been transferring their safety management to consultants and private security firms, who design, evaluate and review their safety programmes; the manufacturing firms are also arranging health, disability, liability, and accident insurances on behalf of their employees. Gubler et al. (2022) note that the firms include external consultants in their safety committees to enhance organizations' safety and positive employee safety attitudes. The prior empirical literature has yet to systematically explore the actual effect of providing insurance and using safety consultants on employee productivity (productive time, degree of accomplishment of tasks).

The existing literature has been faulted in four areas. First, the studies could have evaluated safety transfer wholly based on its six constructs; group health insurance, private security, safety consultants, safety liability insurance, and personal accident insurance. For instance, studies by Owolabi et al. (2016), Nguyen and Zawacki (2019), and Peshawar (2014) focused only on health insurance, while Gilje and Wittry (2021) focused on safety consultants. Second, the studies did not evaluate the effect of safety transfer on employee productivity based on the three measures of employee productivity (productive time, degree of accomplishment of tasks, and value-added). For instance, Owolabi et al. (2016) only used productive time, while Gilje and Wittry (2021) conceptualized labor productivity as value added. Third, the studies by Kurdy et al. (2021), Peshawar (2014), and Gubler et al. (2022) did not generate original findings on the effect of workplace safety transfer on employee productivity. Fourth other studies had methodological limitations; for instance, a study by Otiso and Mutugi (2018) used chi-square tests to determine associations between variables and was limited to insurance safety transfer and safety. Conversely, the current study addressed these research gaps.

This study focused on the manufacturing sector in Kenya due to the sector's inherent safety and productivity concerns; further, the industry receives significant scrutiny by the Directorate of occupational safety over workplace safety practices and compliance with government safety regulations. Over 80 percent of the manufacturing firms in Kenya are based in Nairobi (the capital city), while the rest are located in other major towns (Kenya Association of Manufacturers (Kenya Manufacturers and Exporters Directory, 2018). Despite the Kenyan manufacturing sector being the largest among the East African countries, growth in the sector has been slow at 4.6% in 2018, 3.1% in 2019, and average growth of 3.4% in the last five years. The sector contributes an average of 10.3% to the gross domestic product (GDP) and therefore is considered critical in attaining the country's economic development goals (KNBS, 2022). Employee productivity in the Kenyan manufacturing sector is low, with an output of 2700 dollars per employee compared to the average African output of 3300 dollars per employee and the international standard of 6500 output per worker (International Labour Organization, 2018). Kenya Institute for Public Policy Research and Analysis (KIPPRA, 2023) indicated that workplace incidents in the manufacturing sector had increased by more than 65 percent in the year 2022. Further, Kenya's Directorate of occupational safety and health report (2022) ranked the manufacturing sector as leading in workplace safety issues, with 87% of occupational deaths and injuries reported. These incidents and productivity problems are still experienced even after the institutions have installed various safety management programmes (Society for Human Resource Management, 2023). Therefore the study sought to determine the effect of workplace ergonomics on employee productivity in manufacturing firms in Kenya.

## 2. WORKPLACE SAFETY ERGONOMICS AND EMPLOYEE PRODUCTIVITY

Workplace Safety Ergonomics refers to the science and practice of designing and arranging work environments, tasks, tools, and equipment to fit the physical and cognitive capabilities of employees, in order to promote safety, comfort, and efficiency. The goal is to minimize the risk of injuries, especially musculoskeletal disorders (MSDs), and improve overall worker well-being and productivity. Ergonomics in workplace safety focuses on factors such as posture, repetitive motion, workstation layout, lifting techniques, and the proper use of tools and machinery. By aligning the job to the worker—rather than forcing the worker to adapt to poorly designed tasks—ergonomics helps reduce fatigue, discomfort, and the likelihood of accidents or long-term injuries.

Workplace safety ergonomics is a crucial factor in ensuring employee well-being, minimizing workplace injuries, and enhancing overall productivity. Ergonomics refers to the science of designing work environments, tools, and tasks to fit the capabilities and limitations of employees. When applied effectively, ergonomic principles help reduce strain, fatigue, and work-related musculoskeletal disorders (MSDs), leading to improved efficiency and job satisfaction. A well-designed



ergonomic workplace promotes proper posture, minimizes repetitive strain, and optimizes workflow, ultimately enhancing employee performance. Organizations that invest in ergonomic interventions—such as adjustable workstations, proper lighting, and well-structured work schedules—often experience reduced absenteeism, lower healthcare costs, and increased job satisfaction among workers

Workplace safety ergonomics involves programmes designed to detect and eliminate workplace safety hazards. Extant literature has identified safety ergonomics as a critical and effective construct for workplace safety (Reese, 2018; Strasser, 2022). Laura (2019) posits that workplace safety ergonomics involves designing the workplace and tools for maximum safety. Extant literature by the international ergonomics association report (2019), Reese (2018), and the international safety rating system report (2016) have laid out guidelines for effective safety ergonomics for organisations. The guidelines posit that practical safety ergonomics should address hazard detection, protective devices, and effects analysis. The current study adopted these measures of safety ergonomics.

Further, literature by Dessler and Varrkey (2015), Huang et al. (2022), and Dessler and Varrkey (2015) note that safety ergonomics should include safety audits, robotics, safe working tools, sanitary conveniences, and facility design for safety. When workplace safety ergonomics are adequately adopted, chances of accidents are reduced, and therefore employees are expected to be maximally productive. However, research is required to gain deeper research insights into the importance of workplace safety ergonomics on employees' productivity. The previous empirical literature has failed to investigate this effect adequately. This section reviewed related literature in the context of developed countries outside Africa, developing countries in Africa, and then studies done in the Kenyan context.

Related studies done in the context of organisations in developed countries outside Africa revealed several research gaps; Leber et al. (2018) survey investigated the impact of ergonomically designed workplaces on employee productivity. The study compared the adoption of safety ergonomics for persons with disability in three countries: Poland, the UK (United Kingdom), and Slovenia. The study suggested that ergonomics should be adopted to enhance work efficiency and employee adaptation of tasks enhancing employee productivity. The study was, however, limited to safety ergonomics for persons with disability. Further, it did not indicate which safety ergonomics were adopted for persons with disability and failed to test the empirical relationship between ergonomics and employee productivity. A study by Ravindran (2021) investigated the impact of safety ergonomics on employees' work performance in Co-operative Hospital India. The study was a critical literature review that found that a lack of safety ergonomics leads to increased absenteeism, errors, and sick leaves, which reduces employee productivity. The study was faulted for only focusing on sanitary ergonomics, was conceptualised in a different sector and country from the current study, and failed to generate original research findings. Chintada and Umasankar (2022) investigated the impact of occupational ergonomics and organizational efficiency. It was suggested that ergonomics addresses work-related mental stress and musculoskeletal disorders and hence plays a vital role in productivity. Occupational ergonomics was conceptualized as quality equipment and maintenance, which are partial measures of safety ergonomics. The study results established that ergonomics are related to accident prevention, less fatigue, and employee morale and motivation. Unlike the current study, the study focused on one firm. It did not establish productivity gains due to safety ergonomics through objective measures such as value-added, accomplishment of tasks, and productive time.

Studies on safety ergonomics and employee productivity in African workplaces revealed various research gaps. Sinno et al. (2020) studied the impact of ergonomics on employees' productivity in two workplaces in Lebanon. The study conceptualised safety ergonomics in terms of protective devices, while the current study used three measures of safety ergonomics; hazard detection, protective devices, and effects analysis. The study found that ergonomics programmes did not significantly affect employee productivity, but a lack of ergonomics led to employee stress. The study contradicted the findings from those of Leber et al. (2018) and Ravindran (2021). The study focused on two firms and analysed data using frequencies and percentages, making it difficult to generalise the findings. Pickson et al. (2017) studied the effect of ergonomics on employee productivity at Pioneer Food Cannery in Ghana. The study focused on employee satisfaction with ergonomic challenges, unlike the current study on safety ergonomic programmes and their effect on productivity, using a broader scope of objective measures. The study established that safety ergonomics positively correlates with employee productivity. The study failed to show how employee productivity was measured but recommended empirical research to be done on the impact of ergonomic training on employee productivity.

Ergonomics awareness and employee performance were examined in a study by Olabode et al. (2017), which focused on ergonomics awareness and adoption in Nigerian organisations. This study reviewed the literature on factors that impede the

adoption of comfort and safety ergonomics. Still, it did not evaluate safety ergonomics in place in organisations and their effect on employee productivity. The study findings indicated that employees could not be productive when uncomfortable or unsafe at work. The study did not generate actual results from the firms. Kingsley et al. (2012) examined the impact of office ergonomics on the performance of employees at Ghana Petroleum Corporation. The study revealed that employees were dissatisfied with the office safety designs, finishes, and furnishing. This study failed to specify what aspects of safety ergonomics the employees were dissatisfied with and failed to link this to employee productivity further, the analysis needed to show how employee productivity was conceptualised.

Similar empirical studies in Kenya that attempted to link workplace safety ergonomics to employee productivity have been faulted for several reasons. First, a study (Corgi, 2020) focused on ergonomics and employee performance in Kenya chemical manufacturing plant. The study was a critical literature review and found that the manufacturing company had moderately adopted ergonomics, leading to fewer errors, injuries, and risks of defective products. The study found that the implementation of safety programmes was not supported by ergonomic considerations leading to workers' injuries and several errors and defects by employees. The study, however, needed to collect original findings from the firm rather than presenting the author's opinions on the topic. Second, a study by Osoro and Kanyajua (2019) investigated ergonomics and employee performance in state corporations. The study only focused on office arrangement and lighting ergonomics, which are partial measures, while the current research conceptualised safety ergonomics using a broader scope. The study found low adoption of ergonomics in state corporations and did not evaluate their effect on employee productivity. The study focused on a single firm that was non-manufacturing. Thirdly, a study by Kimwomi (2015) focused on organisational characteristics and performance in manufacturing firms in Kenya. The study revealed that safety ergonomics such as shutoff controls, industrial robots, temperature, light, and sound controls have become common in Kenyan manufacturing companies. However, the study did not investigate the effect of safety ergonomics on employee productivity in manufacturing firms in Kenya. The study's objective was to investigate the effect of workplace safety ergonomics on employee productivity. Thus the study hypothesized that; workplace safety ergonomics has a significant positive impact on employee productivity.

Employee productivity is a critical factor in the success of any organization, as it directly impacts efficiency, profitability, and overall business performance. Productivity refers to the ability of employees to complete tasks effectively within a given time frame while maintaining high-quality standards. It is influenced by various factors, including workplace environment, motivation, training, technology, and organizational culture.

A productive workforce enhances operational efficiency, reduces costs, and improves competitiveness in the market. Organizations that prioritize employee well-being, provide the necessary resources, and implement effective management strategies often experience higher levels of engagement and output. Additionally, factors such as clear job roles, performance incentives, and continuous skills development contribute to sustained employee productivity.

The productivity of employees is an essential concern to every institution worldwide. Employee productivity is employees' ability to accomplish tasks within the standard work hours as described in a work description (Samnani & Singh, 2017). While extant literature has explored measures of employee productivity and the fundamental factors that influence employee productivity, empirical evidence on how workplace safety affects employee productivity outcomes is limited. This study adopted three employee productivity measures; the first is the degree of accomplishment of tasks by employees. This measure was proposed by the European Employee Productivity Institute (2019), which posited that employee productivity could be measured by the degree to which employees produce the required output. Similarly, Laffont and Martimort (2009) and Drucker (2002) agree that the degree of accomplishment of tasks is an objective measure of employee productivity. The current study assessed the accomplishment of tasks through the total number of employees who met their set performance targets per employee dashboard/performance contracts.

Extant literature has pointed out that workplace safety may be affecting employee accomplishment of tasks, but this assertion is yet to be empirically tested. For instance, a study by Karaboga et al. (2022) opined that workplace safety through protection and training leads to work efficiency and accelerated employee adaptation of tasks. Henkel et al. (2019) add that workplace programmes may lead to behavioral changes that may affect the degree to which employees perform routine tasks. Previous studies have further reported inadequate workplace safety in manufacturing firms in Kenya (Mwaruta, 2022; Mburu and Kiuyukia (2017), while other studies (Osoro & Kanyajua, 2019; Simiyu et al., 2020) have noted that fewer employees were meeting their performance targets per the employee dashboard. Extant literature has yet to establish the relationship between workplace safety and employees' degree of accomplishment of tasks.

The second employee productivity measure adopted by the study was value added. Drucker (2002) posits that value added is computed by dividing total revenues by the number of employees in the firm. Extant literature has asserted that workplace safety may affect employees' value added; however, these assertions are yet to be empirically tested. For instance, a study by Kabir et al. (2017) posited that adverse workplace safety incidents such as lost workday cases, liability costs, and restricted duties due to injuries dwindle the employees' value added. A study by Hacamo (2022) adds that manufacturing firms have over-invested in workplace safety, ergonomics, and emergency management, negatively impacting the firm's revenues. The third employee productivity measure adopted by the study was productive time. European Employee Productivity Institute (2017) and Hacamo (2022) stated that worker productivity is measured by comparing the actual hours worked by an employee and the standard work hours during a period. This study evaluated workplace safety programmes against lost work time due to safety incidents. The problem of employee productive time in manufacturing firms has been noted by data from the Bureau of Labour Statistics report (2019) that showed that in 2018, 5.7 million injuries were reported in public and private workplaces worldwide, with manufacturing industries ranking first with 3.2 million employee injuries (Bureau of Labour Statistics report, 2019). Out of the 5.7 million injuries and illnesses reported, about 2.8 million were lost workday cases requiring recuperation, restricted work duties, or both. The remaining 2.9 million were cases without lost workdays (Bureau of Labour Statistics report, 2019). These incidents are still experienced even after the institutions have installed various safety programmes and could reduce employee productive time (Society for Human Resource Management, 2023).

### 3. METHOD

This study adopted a descriptive research design. The study targeted 18 manufacturing firms in Eldoret city County, Kenya. The unit of analysis was the 18 firms while the unit of observation was the heads of human resource and directors in the manufacturing firms in Eldoret City County, Kenya giving a total of 36 respondents selected for the purpose of this study. Since the study population is small, the study worked with entire population which is census. Data collection instrument was questionnaire and other information relevant to the study. A structured questionnaire was administered to the respondents. Piloting was done to test the validity and reliability of the data collection instrument. Once data is collected, it was crosschecked and verified for errors, completeness and consistency. It was then be coded, entered and analysed descriptively using IBM Statistical Package for Social Sciences (SPSS 23). Pearson correlation analysis was used to test the relationship between variables in the study hypotheses. ANOVA and multiple linear regression analysis was adopted computed to determine the statistical relationship between the independent variable and the dependent.

### 4. DISCUSSIONS

The first specific objective of the study was to determine the effect of firm's ergonomics on employee productivity in manufacturing firms in Kenya. The respondents were requested to indicate their level of agreement on statements relating to the effect of firm's ergonomics on employee productivity in manufacturing firms in Kenya. A 5 point Likert scale was used where 1 symbolized strongly disagree, 2 symbolized disagree, 3 symbolized neutral, 4 symbolized agree and 5 symbolized strongly agree. The results were as presented in Table 4.1.

From the results, the respondents agreed that Workplace safety ergonomics is a crucial factor in ensuring employee well-being, minimizing workplace injuries, and enhancing overall productivity. This is supported by a mean of 3.741 (std. dv = 0.851). In addition, as shown by a mean of 4.692 (std. dv = 0.785), the respondents agreed that When applied effectively, ergonomic principles help reduce strain, fatigue, and work-related musculoskeletal disorders (MSDs), leading to improved efficiency and job satisfaction. Further, the respondents agreed that a well-designed ergonomic workplace promotes proper posture, minimizes repetitive strain, and optimizes workflow, ultimately enhancing employee performance. This is shown by a mean of 3.661 (std. dv = 0.873).

The respondents also agreed that Organizations that invest in ergonomic interventions—such as adjustable workstations, proper lighting, and well-structured work schedules—often experience reduced absenteeism, lower healthcare costs, and increased job satisfaction among workers. This is shown by a mean of 3.616 (std. dv = 0.844). With a mean of 3.313 (std. dv = 0.763), the respondents agreed that workplace safety ergonomics involves designing the workplace and tools for maximum safety and should address hazard detection, protective devices, and effects analysis. Further, the respondents agreed that when workplace safety ergonomics are adequately adopted, chances of accidents are reduced, and therefore employees are expected to be maximally productive. This is shown by a mean of 3.551 (std. dv = 0.866).

**Table 4.1: Effect of firm's ergonomics on employee productivity in manufacturing firms in Kenya;**

	Mean	Std. Deviation
Workplace safety ergonomics is a crucial factor in ensuring employee well-being, minimizing workplace injuries, and enhancing overall productivity.	3.741	0.851
When applied effectively, ergonomic principles help reduce strain, fatigue, and work-related musculoskeletal disorders (MSDs), leading to improved efficiency and job satisfaction	4.692	0.785
A well-designed ergonomic workplace promotes proper posture, minimizes repetitive strain, and optimizes workflow, ultimately enhancing employee performance	3.661	0.853
Organizations that invest in ergonomic interventions—such as adjustable workstations, proper lighting, and well-structured work schedules—often experience reduced absenteeism, lower healthcare costs, and increased job satisfaction among workers	3.616	0.844
workplace safety ergonomics involves designing the workplace and tools for maximum safety and should address hazard detection, protective devices, and effects analysis	3.313	0.763
When workplace safety ergonomics are adequately adopted, chances of accidents are reduced, and therefore employees are expected to be maximally productive	3.551	0.866
<b>Aggregate</b>	<b>3.902</b>	<b>0.895</b>

#### 4.2. Employee Productivity in Manufacturing Firms in Kenya.

The respondents were requested to indicate their level of agreement on various statements relating to assess the effect of employee productivity in manufacturing firms in Kenya. A 5 point Likert scale was used where 1 symbolized strongly disagree, 2 symbolized disagree, 3 symbolized neutral, 4 symbolized agree and 5 symbolized strongly agree. The results were as presented in table 4.2.

From the results, the respondents agreed that a productive workforce enhances operational efficiency, reduces costs, and improves competitiveness in the market. This is supported by a mean of 4.761 (std. dv = 0.852). In addition, as shown by a mean of 3.503 (std. dv = 0.812), the respondents agreed that organizations that prioritize employee well-being, provide the necessary resources, and implement effective management strategies often experience higher levels of engagement and output. The respondents also agreed that additionally, factors such as clear job roles, performance incentives, and continuous skills development contribute to sustained employee productivity. This is shown by a mean of 3.823 (std. dv = 0.752). The respondents also agreed that the productivity of employees is an essential concern to every institution worldwide. This is shown by a mean of 3.812 (std. dv = 0.843). With a mean of 3.743 (std. dv = 0.925), the respondents agreed that employee productivity is employees' ability to accomplish tasks within the standard work hours as described in a work description. The respondent also agreed that employee productivity could be measured by the degree to which employees produce the required output. This is shown by a mean of 3.961 (std. dv = 0.911).

**Table 4.2: Employee Productivity in Manufacturing Firms in Kenya.**

	Mean	Std. Deviation
A productive workforce enhances operational efficiency, reduces costs, and improves competitiveness in the market	4.761	0.842
Organizations that prioritize employee well-being, provide the necessary resources, and implement effective management strategies often experience higher levels of engagement and output	3.503	0.812
Additionally, factors such as clear job roles, performance incentives, and continuous skills development contribute to sustained employee productivity	3.823	0.752
The productivity of employees is an essential concern to every institution worldwide	3.812	0.843
Employee productivity is employees' ability to accomplish tasks within the standard work hours as described in a work description.	3.743	0.925
employee productivity could be measured by the degree to which employees produce the required output	3.961	0.911
<b>Aggregate</b>	<b>3.997</b>	<b>0.841</b>



### 4.3 Inferential Statistics

Inferential statistics in the current study focused on correlation and regression analysis. Correlation analysis was used to determine the strength of the relationship while regression analysis was used to determine the relationship between dependent variable (employee productivity in manufacturing firms in Kenya and independent variable (firm's ergonomics).

#### 4.3.1 Correlation Analysis

The present study used Pearson correlation analysis to determine the strength of association between independent variables (firm's ergonomics) and the dependent variable (employee productivity in manufacturing firms in Kenya) dependent variable. Pearson correlation coefficient range between zero and one, where by the strength of association increase with increase in the value of the correlation coefficients. The current study employed Taylor (2018) correlation coefficient ratings where by 0.80 to 1.00 depicts a very strong relationship, 0.60 to 0.79 depicts strong, 0.40 to 0.59 depicts moderate, 0.20 to 0.39 depicts weak.

**Table 4.3: Correlation Coefficients**

		Employee productivity	Firm's ergonomics
<b>Employee productivity</b>	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	30	
<b>Firm's ergonomics,</b>	Pearson Correlation	.821**	1
	Sig. (2-tailed)	.002	
	N	30	30

From the results, there was a very strong relationship between firm's ergonomics and employee productivity in manufacturing firms in Kenya. ( $r = 0.821$ ,  $p$  value  $= 0.002$ ). The relationship was significant since the  $p$  value  $0.002$  was less than  $0.05$  (significant level).

#### 4.3.2 Regression Analysis

Multivariate regression analysis was used to assess the relationship between independent variables (firm's ergonomics) and the dependent variable (employee productivity in manufacturing firms in Kenya).

**Table 4.4: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.892	.729	.726	.399121

a. Predictors: (Constant), firm's ergonomics,

The model summary was used to explain the variation in the dependent variable that could be explained by the independent variable. The  $r$ -squared for the relationship between the independent variable and the dependent variable was  $0.729$ . This implied that  $72.9\%$  of the variation in the dependent variable (employee productivity in manufacturing firms in Kenya) could be explained by independent variables (firm's ergonomics).

**Table 4.5: Analysis of Variance**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.613	1	3.054	51.12	.000 <sup>b</sup>
	Residual	6.471	29	.031		
	Total	30.084	30			

a. Dependent Variable: employee productivity in manufacturing firms in Kenya

b. Predictors: (Constant), firm's ergonomics,

The ANOVA was used to determine whether the model was a good fit for the data. F calculated was 51.12. The p value was 0.000. The model was considered as a good fit for the data. Therefore, the model can be used to predict the influence of firm's ergonomics on employee productivity in manufacturing firms in Kenya.

Table 4.6: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.619	0.023		4.912	0.000
	Firms ergonomics	0.586	0.057	0.324	3.081	0.000

**a Dependent Variable:** employee productivity in manufacturing firms in Kenya.

The regression model was as follows:

$$Y = 0.619 + 0.586X_1 + \epsilon$$

According to the results, firm's ergonomics has a significant effect on employee productivity in manufacturing firms in Kenya.  $\beta_1=0.586$ , p value= 0.000). The relationship was considered significant since the p value 0.004 was less than the significant level of 0.05.

## 5. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings, the study concluded that firm's ergonomics has a significant effect on employee productivity in manufacturing firms in Kenya.  $\beta_1=0.586$ , p value= 0.000). The relationship was considered significant since the p value 0.004 was less than the significant level of 0.05. The study came up with the following recommendations; the management of the manufacturing firms should be able to improve on the ways they handle risks. The management should employ equipment's to take care of emergencies in reduction of accidents. They should adopt effective work place safety programmes which should involve establishing a suitable safety environment, ensuring a sound working environment while maintaining an appropriate risk administration to monitor the process and minimize employees' exposures.

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