

Estimating Costs and Benefits of Preventive Ergonomic Measures

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Abstract: Ergonomics is becoming increasingly relevant in industrial enterprises, as confirmed by the majority of Industry 5.0 experts who place emphasis on the development of social environments and employee care. This is gradually being integrated into legislation stipulating the obligation to provide employees with adequate working conditions. In the context of introducing necessary ergonomic measures in the workplace, we identify the dependence of these measures on the physical load of workers and the impact on the employer's financial burden. To determine the impact, a Cost-Benefit Analysis is used to evaluate not only the financial costs but also to assess social benefits and increased utility for the target groups. The verification of ergonomic optimisation of the workplace in terms of costs and impact on workers' health is conducted in a case study in a specific industrial enterprise. Finally, the positive impact of ergonomic optimisation on the physical load of workers is specified.

Keywords: CBA; ergonomics; financial costs; physical load

1 INTRODUCTION

Cost-benefit analysis (further referred to as CBA) is used to evaluate investment projects, strategic decisions, project plans, as well as individual tasks. It serves both to evaluate the financial costs of the project and the income flowing directly to the founder, but also to financially evaluate all the social benefits (e.g. tourism development) that the project will bring, whether for locals, city or state. The cost-benefit analysis therefore provides an opportunity to assess how advantageous the investment will be for public projects. That is, for projects where the goal is not to maximize profits, i.e. financial return, but to increase the benefit of target groups - social benefit. This assessment of the profitability of the investment can be made by converting indirect benefits into financial amounts. [1, 2]

CBA consists of several elements:

- Effects resulting from the investment - all impacts on target groups that the implementation of the project brings. These impacts can be financial and non-financial and are positive, negative or neutral.
- Costs - these are all negative impacts on the examined entities / target groups, i.e. negative effects resulting from the investment.
- Benefits - these are all positive impacts on the examined subjects / target groups, positive effects resulting from the investment.
- Beneficiaries - this is an entity / target group that is affected by both positive and negative impacts resulting from the investment.
- Criteria indicators - these are several standard indicators that are an important factor for deciding whether a project is meaningful or not. According to their values, projects can be compared with each other. [1]

On the other hand, ergonomics is an interdisciplinary field based on several scientific disciplines such as physiology, psychology of work, anthropometry, biomechanics, or safety, hygiene and philosophy of work. Ergonomics can then be defined as a scientific discipline that

deals with the relationship between man, the work equipment (work tools, machines, tools and other work aids) and the work environment within the work process [3]. It is important to ensure that the three components are interlinked, as they affect the performance and quality of workers' work. The aim of ergonomics is to adapt the workplace and create such working conditions that:

- do not cause disproportionate workload,
- meet the requirements of human health and safety,
- minimize the effects of negative influences,
- optimize the mental and physical load,
- ensure personal development at maximum efficiency. [6, 7]

It is evident from the above stated points that the work environment should be designed (or adapted) to meet the needs and physical capabilities of a person: The person cannot adapt to a task, the task and environment should be adapted to the person. [5, 6]

1.1 Health Risks

Inadequate adaptation of the working environment to ergonomic requirements can negatively impact workers' performance, work quality, and most importantly, their health [4].

One common health issue associated with work is musculoskeletal disorders, which affect the joints and other tissues, particularly in the neck, back, shoulders, and upper limbs. These disorders can arise from factors such as excessive mechanical load, inappropriate postures, or improper handling of loads, all of which can be attributed to poor workplace ergonomics. Musculoskeletal disorders can range from minor pain to severe health problems and may qualify as occupational diseases. The development of these disorders is often gradual and influenced by a combination of physical and biomechanical, organizational, psychosocial, and sociodemographic risk factors [8].

By creating suitable workplace conditions, such as addressing unnatural and static postures or repetitive

movements, many of these risk factors can be significantly reduced. The declining health of workers can lead to increased doctor visits, long-term treatment needs, work absences, or even a forced career change. These issues not only affect the workers themselves but also impact the overall functioning of the company.

1.2 Ergonomic Rationalization

When trying to create a workplace that follows ergonomic guidelines, several elements should be taken into account, in particular the following:

- nature of work activity,
- the position of the worker when performing work,
- organization of work at the workplace,
- workplace equipment and to what extent the workplace will be used,
- possible mobility of the workplace,
- time required for the workplace activity,
- hygienic and safety regulations according to legislation and according to the given company,
- and other no less important aspects such as compliance with the rules set by the company for a specific workplace. [9]

Evaluating work equipment involves applying ergonomic criteria to strike a balance between a person's capabilities and the requirements of the equipment in given environment. From a workplace perspective, this includes considering the working space, dimensions, working plane height, and the impact on the worker's body dimensions and lower limbs. Additionally, the working environment's lighting, visual conditions, psychosocial aspects, and acoustic conditions are also crucial. From the worker's viewpoint, attention is focused on physical exertion, handling loads, suitable working positions that promote physiological comfort and frequent changes and preventing long-term unilateral overloading [6].

Numerous sources highlight the positive effects of adhering to ergonomic standards in the workplace. The objectives of ergonomic practices can be summarized as follows: arranging workplaces and processes to meet health, safety, and comfort requirements; maintaining workers' health and permanent work capacity; preventing worker overload; ensuring increased employee satisfaction; and improving the economy through ergonomic workplace design [10, 11].

The introduction of ergonomic methods is suitable both in production and non-production processes. Ergonomic rationalization of the workplace (meaning improved working environment and ergonomic conditions) can bring many benefits, such as:

- improvement of work well-being,
- reduction of worker fatigue,
- increase in the concentration of employees,
- reduction of scrap,
- increasing the prestige of the company,
- increase in employee satisfaction,

- decrease in potential occupational diseases or accidents at work,
- reduction of costs for employees who have to deal with problems associated with unsuitable ergonomics in the company (HR, HSE, etc.),
- potential increase in worker productivity,
- financial savings,
- work safety,
- increase of work efficiency.

Indirectly, the improved environment should also be reflected in a declining rate of fluctuation. Workplace rationalization is typically part of an ergonomic project, often following an ergonomic audit. The audit assesses various areas, including compliance with legal requirements, employee perception (through surveys), and specific parameters of the operation or workplace (e.g., physical load, noise, vibration, visual load) [12].

Rationalization of the workplace in terms of ergonomics can be done in many ways. The basic ones include reorganization of the workplace, the acquisition of special products or ergonomic equipment. Simple workplace modifications, which are often necessary, but can also be highly beneficial, include:

- adjusting the appropriate height of the desk and chair,
- placing frequently used objects in the optimum working plane,
- reducing reach distances,
- the acquisition of appropriate equipment to facilitate material handling,
- establishing standards for work activities and displaying them clearly in the workplace,
- provision of the necessary personal protective equipment,
- adjustment of lighting,
- change in the storage of material. [13]

As a part of a simple reorganization of the workplace, one of the main goals is, as mentioned above, to shorten the reach zones, which will achieve not only the elimination of unacceptable or conditionally acceptable working positions of the trunk or arms, but also reducing the time needed to complete the work task (assemble the product, produce a part etc.). Time savings can be calculated using methods like MOST or MTM, which determine standard task times. For instance, reducing the reach distance from 60 cm to 20 cm can save approximately 0.7 seconds, or even more if the distance exceeds 60 cm. While these timesavings may seem small individually, they accumulate significantly over the entire production cycle.

However, in case of timesavings, it is necessary to take the possible increase in the production standard in the workplace into account as well, which can have an increasing effect on local muscle load. Local muscle load is the most suitable indicator of the most common occupational diseases in the Czech Republic. From the point of view of Czech legislation, the maximum number of hand and forearm movements that a worker can perform during an average 8-hour shift is determined. This limit is given by the Czech

government regulation No. 361/2007 Coll. The numbers of movements refer to the measured % Fmax. However, a maximum of 27,600 movements can be performed by a worker. [14]

Ergonomic rationalization also comes with financial costs. In general, the costs associated with rationalization can be divided into investment and operating. Investment costs are one-time costs for the project. Operating costs are those costs that are directly related to the workplace - scrap, production costs, compliance with safety, waste. Through ergonomic rationalization, we try to reduce operating costs, but therefore we have to make the initial investment. The CBA method is used to decide whether an investment is acceptable, as company stakeholders need to assess the return of investment [11].

2 METHODOLOGY

Proposed CBA Processing procedure consist of the following steps:

- Description of the nature of the project.
- Creation of a financial plan from the perspective of the investor or sponsor.
- Definition of the beneficiaries of an ergonomics project in an industrial enterprise.
- Definition of the maximum of all benefits and benefits over the life cycle of the investment.
- Classification of benefits into quantifiable and non-quantifiable.
- Conversion of quantifiable benefits and costs into cash flows.
- Interpreting the results, assessment of the results and decision on the acceptability of the investment and evaluation of the financeability and sustainability.

Having a clearly defined plan for the project is crucial for further evaluation process. For this reason, the first step of the methodology is further defined by the following points:

- Definition of all stakeholders and their distribution (e.g. households, enterprises, municipality, state, ...).
- Describing the zero and investment option projects and their difference.
- Identifying the maximum of all benefits and costs for all project life stages, breaking them down into quantifiable (valued) and non-quantifiable (non-valued).

To convert quantifiable benefits and costs into cash flows automatic calculator was created. This calculator allows us to enter variables applicable to the specific company and work position. These variables include:

- number of working days,
- number of shifts,
- time pool of work,
- length of safety breaks,
- cost per employee per hour,
- number of workers per position,
- tact per piece,
- revenue from sales per piece,

- cost of ergonomic rationalisation (purchase of fixtures, ergonomic tables, etc.),
- reduction of reach zones,
- savings in work movements,
- number of rejects,
- amount of waste,
- cost of medical examinations,
- costs associated with multiple jobs in other departments (e.g. HR, HSE, foreman).

At the same time, the risks and costs of occupational accidents and illnesses should also be taken into account. In the Czech Republic, according to the Labour Code, the employer is obliged to compensate the employee for damage or non-pecuniary damage caused by an occupational accident or occupational disease, if such damage or damage was caused to the employee:

- in the case of an accident at work during the performance of work tasks or in direct connection with it,
- in the case of an occupational disease, if the employee last worked for the employer under the conditions under which the occupational disease normally arises before it was discovered. [15]

The employer shall be obliged to compensate the employee for the related damage or non-pecuniary damage, even if he has complied with all his obligations under the relevant legislation, unless he waives the obligation to compensate for the damage or non-pecuniary damage in completely or in part. The employer may only waive its obligation to compensate for damage or non-pecuniary damage provided that the damage or non-pecuniary damage was caused either by a culpable breach of the law by the employee or solely as a result of the employee's drunkenness or abuse of other addictive substances.

The Labour Code further provides that an employee is entitled to claim the following types of compensation in the event of the employer's liability for an occupational accident or disease:

- compensation for loss of earnings during the period of incapacity for work,
- compensation for loss of earnings after the end of the incapacity for work,
- compensation for pain and suffering, (reasonable medical expenses) and compensation for damages in kind, if any. [15]

In addition to the Labour code, the details are also further specified by Government Regulation No. 276/2015 Coll. Compensation for loss of earnings during the period of incapacity for work shall be payable to the employee in the amount of the difference between the average earnings before the damage (caused by the work-related accident or occupational disease) and the full amount of the wage or salary compensation received during the period of incapacity for work.

Compensation for loss of earnings after the end of incapacity for work or on recognition of disability shall be due to the employee for difference between the average

earnings before the damage and the earnings after the work injury or occupational disease (plus any disability pension - if any - received for that reason). However, compensation for loss of earnings after the end of temporary incapacity for work shall not be payable until the employee reaches the age of 65 or retirement age, if higher, or until the date on which the old-age pension is awarded.

In the event that an employee is dismissed from employment, because of occupational illness, the employer is obliged, among the things mentioned above, to pay him or her a bonus equal to 12 months' average gross salary received in the course of employment. [15, 16]

3 CASE STUDY

An ergonomic rationalisation of the workplace in an unnamed industrial company was carried out. The company, in which this case study was performed, is located in Pilsen region in the Czech Republic. It specializes in the production of intelligent automated storage solutions that are tailored to customer requirements. The case study was focused on the position of warehouse reception area. Within the project brief, the use of robots or cobots was ruled out by the company itself and therefore not considered further in the study.

The following activities are carried out at the workplace by employees in the position of warehouse reception area. As part of their work, the workers receive goods, recheck them, repalletise them and sort them into pallets to be used later. The worker handles the administration of the shipments on the PC, prints the labels, which she then applies to the pallets to be shipped. She then takes the pallets ready for dispatch to their destination on a pallet truck. She also sorts the received shipments. The worker manually transfers each shipment from the pallet to the workbench, unpacks and then rearranges the KLT boxes as required and manually places them on the sliding line.

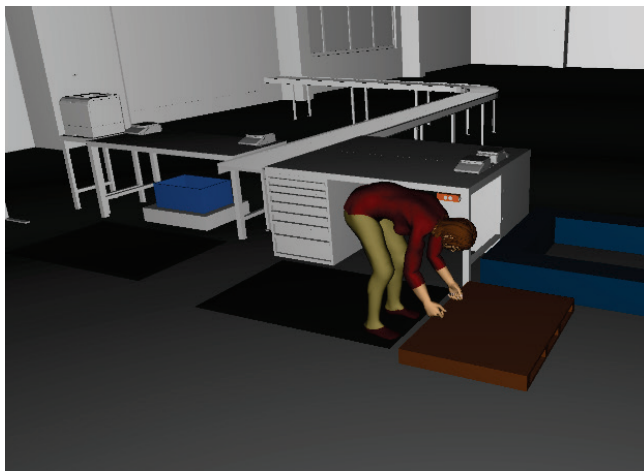


Figure 1 Original workplace state [author]

The work is performed standing with moving around the work area. Personal protective equipment includes work boots, gloves, safety glasses and reflective vest. The

maximum weight of the manually handled load is 17 kg. A visualisation of the workplace is shown in the figure below.

The work activity was examined and evaluated in this case study, is performed by female workers in three-shift operation. The female workers work in 8-hour shifts. They have a 30-minute lunch break and two 10-minute safety break for rest and relaxation. The ergonomic study was carried out on all female workers employed in the position, aged 33 to 45 years, average weight 63 kg, average height 172 cm. After workplace rationalization was performed, the workplace was analyzed for the female population, 5th, 50th and 95th percentile of the German population.

The initial state of the workplace was, in accordance with the Czech legislation, classified into the third work category based on:

- measured local muscle strain,
- the occurrence of conditionally acceptable and unacceptable working positions for more than the maximum permitted time during a shift.

This classification forces the company management to introduce safety breaks after 2 hours for 10 minutes, which is a regulation that is set by Czech legislation and must be observed. In case of non-compliance, the company faces heavy fines.

Based on the initial ergonomic analysis, several problems were identified:

- inappropriate handling plane,
- large number of working movements,
- the occurrence of excessive muscle forces when handling heavy KLT boxes,
- frequent bending of the trunk and unacceptable working position of the upper limbs.

Handling heavy loads and frequent trunk flexion can increase the risk of musculoskeletal problems in various parts of the body, including the lower back, shoulders, neck, and arms. These activities can lead to acute injuries such as strains, sprains, and muscle spasms, as well as chronic conditions such as degenerative disc disease, herniated discs, and spinal stenosis. In particular, frequent trunk flexion (bending forward at the waist) can increase pressure on the lower back, leading to strains and sprains in the muscles and ligaments of the lumbar spine. It can also compress the intervertebral discs, causing disc herniation and nerve compression, which can result in pain, numbness, and weakness in the lower extremities.

Therefore, it is important to use proper lifting techniques and ergonomic principles to minimize the risk of injury when handling heavy loads and bending frequently. Additionally, regular exercise and stretching can help strengthen the muscles and improve flexibility, reducing the likelihood of musculoskeletal problems.

As part of the rationalisation of the workplace, adjustments were made which allowed the workplace to be reassessed and reclassified as second work category. These were relatively simple modifications to the workplace that included:

- height-adjustable electric trolleys,

- height-adjustable tables for working in the ideal working plane,
- other equipment such as precision scales for weighing materials to eliminate the number of upper limb movements when manually counting parts.

You can see a visualisation of the new state in the image below.

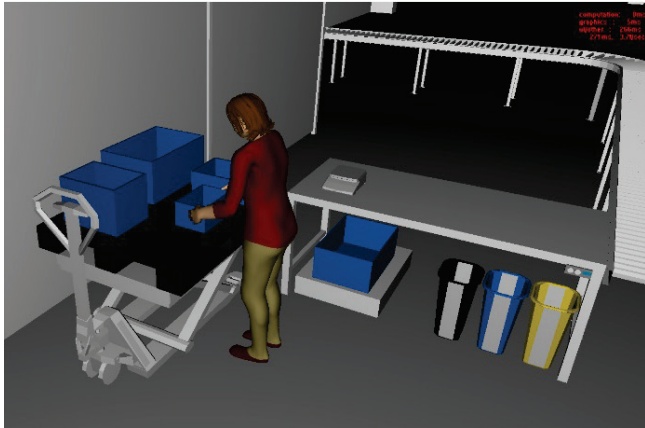


Figure 2 Workplace state after rationalisation [author]

Workplace rationalization was performed on one-work stations and the total cost of the rationalisation was set at 2,000 euros. On the other hand, the change of classification from the third to the second work category has led to multiple savings and benefits. The savings and benefits identified in this particular case study are listed and explained below together with their beneficiaries:

3.1 Time Savings

In this case, timesavings are achieved in three categories:

- Due to the original classification into the third work category, the mandatory safety breaks were previously respected (specifically 10-minute safety breaks after every 2 hours of work). After being classified as a second work category, these breaks are no longer needed, which accumulates to timesavings of 20 minutes per worker per 8-hour shift. In this case, considering the three-shift mode of operation, the total savings per day equal to 60 minutes. When considering 252 working days in the year and average cost per employee per hour of 21 euros, these time savings equal to savings of 5 292 euros. In this case, the main beneficiary is the enterprise itself (or its owner) as the daily production standard grows.
- One of the elements of rationalisation was shortening of the reach zones. In particular, the part of the work process, where the worker has to bend to pick up the part from the pallet on the ground was revised – parts are now located at the height of the working plane using height-adjustable electric trolleys. This eliminates the need to bend down to pick up individual pieces, which also reduces trunk flexion during the work shift. This time saving is calculated using the MOST system (Maynard operation sequence technique):

- A) Consumption of time when removing a part from a pallet placed on the ground is shown in the table below.

Table 1 MOST calculation for original workplace state

General relocation	Index	Time (s)	Description
Actions at a certain distance	A	1	0,36 within reach
Body movement	B	6	2,16 bend down and straighten up
Gaining control	G	1	0,36 grab
Actions at a certain distance	A	1	0,36 within reach
Body movement	B	0	0 no movement
Placement	P	1	0,36 let go
Total time consumption (s)		3,6	

- B) Consumption of time when removing a part located at the height of the working plane is shown in the table below.

Table 2 MOST calculation for workplace state after rationalisation

General relocation	Index	Time (s)	Description
Actions at a certain distance	A	1	0,36 within reach
Body movement	B	0	0 no movement
Gaining control	G	1	0,36 grab
Actions at a certain distance	A	1	0,36 within reach
Body movement	B	0	0 no movement
Placement	P	1	0,36 let go
Total time consumption (s)		1,44	

As the calculation shows, 2.16 s was saved per one piece. This causes an increase in the flow of incoming components and can be associated with a smoother production flow. During the average 8-hour shift, the worker is supposed to process 300 pieces. When considering, three shifts per day, this equals to daily time saving of 32,4 minutes. When considering 252 working days in the year and average cost per employee per hour of 21 euros, these time savings equal to savings of 2 857 euros. In this case, the main beneficiaries are both the enterprises (again, as the daily production standard grows) and the workers (as the occurrence of unsuitable working positions is reduced).

- Another way of saving time was through the acquisition of accurate measuring scales, which not only eliminated work movements, but also increased the efficiency of individual workers. At the same time, the accuracy of loading was increased. In this case, the main beneficiaries are both the enterprises (again, as the daily production standard grows) and the workers, as inappropriate and unnecessary finger and forearm movements have been eliminated.

3.2 Health Benefits

Ergonomics rationalization is a process of optimizing the workplace design and organization to promote comfort, safety, and productivity [10]. This approach considers the capabilities and limitations of human beings in their work environment and seeks to minimize the risk of injury, fatigue, and stress. In recent years, there has been growing recognition of the health benefits of ergonomics rationalization, as evidenced by numerous studies and initiatives aimed at promoting this approach. In the next

paragraphs, the various health benefits of ergonomics rationalization and its potential impact on the well-being of workers are listed.

- **Reduced Risk of Musculoskeletal Disorders** - one of the primary health benefits of ergonomics rationalization is the reduced risk of musculoskeletal disorders (MSDs). These are injuries or disorders affecting the muscles, tendons, ligaments, nerves, or joints due to repetitive or forceful movements, awkward postures, or other physical stresses. MSDs are a common cause of pain, discomfort, and disability among workers, and they can lead to lost productivity, increased healthcare costs, and reduced quality of life. Ergonomics rationalization can help prevent MSDs by optimizing the workplace design and organization to reduce physical stress and strain on the body. This may involve adjusting the height and angle of work surfaces, providing ergonomic chairs and tools, reducing the weight and size of objects, and minimizing the need for repetitive or forceful movements. By reducing the physical demands of work, ergonomics rationalization can help prevent MSDs and improve the overall health of workers.
- **Improved Posture and Movement Patterns** - another health benefit of ergonomics rationalization is the improved posture and movement patterns of workers. Poor posture and movement patterns can contribute to a range of musculoskeletal problems, as well as fatigue, stress, and reduced productivity. Ergonomics rationalization can help workers adopt better postures and movement patterns by providing ergonomic chairs, desks, and tools that promote neutral positions, as well as training and education on proper lifting, reaching, and other movements. By promoting better posture and movement patterns, ergonomics rationalization can help workers reduce the risk of injury and fatigue, as well as improve their comfort and efficiency at work. This, in turn, can lead to better health outcomes and improved productivity for both workers and employers.
- **Reduced Fatigue and Stress** - a third health benefit of ergonomics rationalization is the reduced fatigue and stress experienced by workers. Fatigue and stress can result from prolonged exposure to physical, mental, or emotional demands, and they can have a range of negative health effects, including reduced immune function, increased risk of chronic diseases, and impaired cognitive and emotional functioning.

Above-mentioned benefits are relevant for the overall concept of the methodology as well as for the case study described in this article.

3.3 Financial Cost Savings

The third work category includes work where the health limits are exceeded or the criteria for inclusion in this category are met. At the same time, biological exposure of natural persons is not reliably reduced by technical measures and the use of personal protective equipment is necessary for

this purpose. The statistically higher incidence of occupational diseases is also an important criterion for classifying work in the third category.

As the incidence of occupational diseases is more frequent, there is also a need to check the health of workers more frequently, for which reason compulsory occupational medical examinations are ordered once every 2 years with a special examination for a risk factor, for example, in the case of a risk in local muscle stress, a measurement by electromyography must be carried out.

In the case of the third work category, basic safety conditions must be observed - this is either controlled rotation between workplaces. The controlled rotation must be recorded and archived for 10 years. It must be kept both on paper and electronically. This incurs the cost of recording employee attendance. In the event that rotation is not an option, safety breaks are ordered, these must be after 2 hours and for 5-10 minutes. The employer determines the length of safety breaks. However, during this time the enterprise loses the pieces produced and pays the workers during the "off" time, thus incurring a cost in the form of the employee's wage and lost profit due to the unproduced pieces.

In the case of the third category of work, the use of personal protective equipment is also necessary - it varies according to the type of risk of the workplace. Workers also need to be properly trained, this is usually the job of the HR or HSE (Health and Safety Executive).

The rationalisation of the workplace has brought us into the second working category, reducing the cost of occupational health checks and mandatory safety breaks. At the same time, the efficiency and effectiveness of the workforce has been increased and the potential for spinal or upper limb injuries and potential occupational disease has been eliminated. Elimination of occupational health checks equals to the average saving of 350 euros per year for the occupational checks themselves.

Table 3 Supporting processes

Employee position	Hours per year	Hourly costs (euros)	Saving (euros)
HR	20	51	1020
HSE	25	42	1050
Warehouse manager	20	42	840
Head of warehouse reception	15	34	510

However, other departments of the company are also involved in the supporting processes, which can be much more complicated when the workplace is categorized in the third work category and health limits are exceeded. According to the information from the examined company, the workers involved include HSE, warehouse manager, HR and head of warehouse reception. These supporting processes include involvement in authorised measurements of physical load, administrative work regarding occupational health checks or dealing with employee fluctuation (e.g. HR searching for new employees, training of new employees, purchase of protective equipment or clothing). In the past years, there have also been multiple instances of work accidents. The company provided us with an estimate of hours each employee spends working on above-mentioned

activities or resolving the issues connected to them. The time consumption, hourly costs of employees and quantified savings are listed in the table below, in sum the saving come to 3420 euros.

According to the Labour Code, the employer is obliged to continuously search for hazardous factors and processes of the working environment and working conditions, to identify their causes and sources. This also involves regular measurement of physical load performed by external authorized laboratory based on the risk factor of exceeded physical load. Average cost for this measurement in the Czech Republic is set out at 1000 euros. The need for this measurement is eliminated by recategorization of the workplace into the second work category (due to the ergonomic rationalisation).

3.4 Summarized Savings

Based on a recalculation of the benefits and costs of ergonomics in the company, it was calculated that after the rationalisation, which would require initial investment of 2,000 euros, with the average wage of the female workers, around 11,000 euros would be saved per year (the savings are described in more detail in the previous sections).

4 DISCUSSION AND CONCLUSION

This article contains the research part, which is focused on defining the importance of following ergonomic principles within industrial enterprises and the possible negative consequences of not doing so. Further, it elaborates on the possibilities of evaluating the benefits of implementation of ergonomic measures through Cost Benefit Analysis.

The following conclusions can be drawn from the research carried out:

- 1) Workplace rationalisation has an impact on ergonomic design.
- 2) The ergonomic design of the workplace has an impact on the health of the worker.
- 3) The physical condition of the worker influences his mental state and therefore his performance.
- 4) The quality of work environment and working conditions affects employee turnover.
- 5) If ergonomic rules are not followed, there is a higher risk of workers suffering from musculoskeletal disorders or occupational diseases.
- 6) The relationship between the financial costs and benefits of ergonomic solutions has not been comprehensively addressed.

Following these statements, a methodology for evaluating the benefits of ergonomics using CBA was formulated and subsequently explained and quantified on a specific example of workplace rationalization.

This case study illustrates how the proposed methodology can be used to objectively assess the benefit of potential modification of the workplace aimed at improving working conditions (particularly in terms of ergonomics).

Having an independent and objective assessment is fundamental during any decision-making process, and the decision on future investment in workplace rationalisation is no exception. This approach allows a comparison between several possible options and defines benefits for individual beneficiaries / stakeholders.

Currently, the methodology is designed primarily to reflect the conditions set out in the Czech national legislation. The authors of this study see potential in extending the methodology for use in other countries within the European Union. This would require further research to identify common points but also differences in legislation regarding public health and limitations of working conditions in individual countries.

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