

Physical Fitness Factor Analysis on Employees at the Fertilizer Company

Analisis Faktor yang Berhubungan dengan Kesehatan Jasmani Karyawan di Perusahaan Pupuk

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ABSTRACT

Introduction: Work capacity is related to the ability required for finishing a job at a certain period, and its performance is influenced by physical fitness. PT Petrokimia Gresik's medical check-up result in 2018 showed that there were only 51% of employees with good physical fitness, 37.8% with average physical fitness, and the other 11.2% was not tested due to illness or was pregnant. The objective of this research was to understand the contributing factors that can affect the physical fitness of the employees that were actively involved in physical exercises in PT Petrokimia Gresik. **Method:** This research was non-reactive or unobtrusive with cross-sectional research design and conducted in December of 2019. The population was employees that have previously done medical check-up after physical exercise for more than 24 activities with a minimum of 126 km within 3 months amounted to 90 and had 55 samples gathered by using the simple random sampling technique. The independent variables were age, work period, and the frequency of exercise. The dependent variable was the physical fitness calculated by ergocycle during the medical check-up. The data analysis was done descriptively and the correlation test was done by the Chi-Square and Fisher's Exact Test. **Result:** In this research, some employees were older than 30 years old (54.5%), male (98.2%), have working period longer than 3 years (65.6%), have normal-day working system (76.4%), performing exercises for at least 3x per week (56.4%), and had a good physical fitness (78.2%). **Conclusion:** age and working period are the factors related to the physical health of the employees, meanwhile exercising has no connection with the physical health of the employees if it is done without intensity and duration monitoring.

Keywords: exercise, individual characteristics, physical fitness

ABSTRAK

Pendahuluan: Kapasitas kerja berkaitan dengan kemampuan untuk menyelesaikan pekerjaan pada waktu tertentu, salah satunya dipengaruhi oleh kesehatan jasmani. Hasil medical check up karyawan PT Petrokimia Gresik tahun 2018, menunjukkan bahwa hanya 51% karyawan yang memiliki kesehatan jasmani baik, sisanya 37.8% karyawan dengan kesehatan jasmani sedang, dan 11.2 % lainnya tidak melakukan test kebugaran jasmani dikarenakan terdapat penyakit penyerta dan atau sedang hamil. Tujuan penelitian ini adalah mengetahui faktor yang berhubungan dengan kebugaran jasmani karyawan yang aktif mengikuti olahraga di PT Petrokimia Gresik. **Metode:** Penelitian ini adalah penelitian non-reactive atau unobtrusive dengan desain penelitian cross sectional dilakukan pada Bulan Desember 2019. Populasi penelitian merupakan karyawan yang melakukan medical check up setelah berolahraga lebih dari 24 aktivitas dengan minimal 126 km selama 3 bulan yaitu 90 karyawan dan 55 sampel menggunakan teknik simple random sampling. Variabel independen penelitian ini adalah umur, masa kerja, dan frekuensi olahraga, sedangkan variabel dependennya kebugaran jasmani yang diukur dengan ergocycle saat medical check up. Analisis data dilakukan secara deskriptif dan uji hubungan dengan Chi Square dan Fisher's Exact Test. **Hasil:** Pada penelitian ini sebagian karyawan berusia diatas 30 tahun (54.5%), laki-laki (98.2%), masa kerja diatas 3 tahun (65.5%), sistem kerja normal day (76.4%) melakukan olahraga minimal 3x seminggu (56.4%) dan memiliki kebugaran jasmani baik (78.2%). **Simpulan:** Umur dan masa kerja merupakan faktor yang berhubungan dengan kesehatan jasmani karyawan, sedangkan frekuensi olahraga apabila tidak ditinjau dengan intensitas dan durasi maka tidak berhubungan dengan kesehatan jasmani karyawan yang mengikuti kegiatan olahraga

Kata kunci: karakteristik individu, kebugaran jasmani, olahraga

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INTRODUCTION

Labor health is a form of investment to achieve maximum productivity level of a company. The ever-expanding industry and individual characteristics difference might lead to the change in disease patterns due to its common relationship with the employees of a company (Sary, 2010). The newest data released by the International Labor Organization (ILO) claimed that every year, around 2.78 million workers died to work accidents and illness caused by their jobs or occupations (International Labour Organization, 2018).

Non-infectious Disease is leading the cause of death in the world, killing about 36 millions of life per year. More than 80% of deaths are caused by cardiovascular disease. The increase in Non-infectious Disease in the last few decades also happened in Indonesia (Ministry of Health, 2017). This happened because of an epidemiology transition from a dominant infectious disease to a non-infectious disease. Furthermore, the highest number of casualties that happen to the workers is caused by heart disease, which is calculated to be at 710.760 cases, followed by cancer at 553.091 cases and stroke at 167.661 cases (Zahtamal et al., 2015).

A medical check-up is an act of prevention that is often used to detect and measure the occurrence of diseases or illnesses early. This program is done to warn the workers about the danger of diseases and illnesses. Some of more important parts of this medical examination are the anthropometric measurement and physiology test (internal body system function). One of the most important aspects of an internal body system function for doing work is its ability to preserve physical fitness (Herianto and Dewi, 2012).

Productivity is influenced by three factors, which are workload, work capacity, and additional workload caused by the work environment. The work capacity is related to the ability to finish assigned work at a certain period. Work capacity is influenced by various factors, such as age, gender, working period, work system, and physical health (Tarwaka, 2015).

Physical fitness is related to one's physical ability and willingness to execute their daily assignments effectively and efficiently in a relatively long period without causing massive work fatigue. This means that the worker will still have enough backup stamina to do other assignments (Nurfadli, Jayanti, and Suroto, 2015). It is required for the

workforce or labor to have good physical fitness to be not easily fatigued and to perform their work well for a long period (Tarwaka, 2015).

Physical fitness is divided into two categories, the first one is health-related physical fitness and the second one is ability-related physical fitness (Ismawarti, 2008). The health-related physical fitness covers the function of physiological aspect on illness prevention as a result of a less mobile lifestyle, while physical fitness related to skill is a basic physical ability that an individual has to possess to do physical activity for reaching a goal (Sepriadi, Hardiansyah, and Syampurna, 2017).

One's age is related to the physical capacity in which their strength will increase gradually and peaked at the age of 25. After the peak in physical strength (age 25) what follows will be the decrease in VO_2 max, eye sharpness, hearing, the quickness in distinguishing something, decision making, and short-term memory. The age effect will always be a consideration in giving a job opportunity to an individual (Tarwaka, 2015).

Physical fitness is also influenced by the working period. The working period is related to the work experience that an individual has which enables him/her to further understand and execute the job. The working period will determine the worker's health, efficiency, effectiveness, and productivity. The increase in an individual's age and work duration results in a better understanding of environmental hazards that the individual has in the workplace (Suma'mur, 2009).

An exercise is a form of a scheduled, structured, and continuous physical activity while also involving repetitive movements for the body with certain limitations to elevate his/her physical fitness (Ministry of Health, 2015). Doing physical activity or exercise regularly will improve and maximize the body's function to consume oxygen, affecting physical fitness (Sepriadi, Hardiansyah, and Syampurna, 2017). The effect can be seen and felt should the daily physical activity is routinely performed for the next 3 months (Wahyuningsih, 2015).

Bryantara (2016) explained that age, gender, genetics, Body Mass Index (BMI) status, and physical activity contribute as the factor that can affect an individual's health level and physical fitness. Furthermore, Fikar, Suroto and Wididjasena (2017) stated that internal factors and external factors are the two main factors that often contribute to the physical fitness level of an individual. The

internal factors mentioned include genetic factors, age, gender, nutritional status, smoking habit, exercise habit, health status, working period, and alcohol consumption. Meanwhile, the external factor includes workload, work shifts, recovery time, and monotonous work.

Nurfadli, Jayanti, and Suroto, (2015) explained that there was a correlation between frequent physical exercise with the physical fitness of construction workers in PT. PP (Persero) Tbk for Semarang Pinnacle Apartment Project. Other research was also conducted by Rahmawati, Suroto, and Wahyuni (2016) which explained that there was no correlation between age, work period, and nutritional status of PT. Gapura Angkasa porter in Ahmad Yani Airport when it came to physical fitness.

The physical workload was one of many aspects connected to the physical fitness of the worker. Prativi, Soegiyanto, and Sutardji (2013) explained in their research that there was a physical difference between before and after physical exercise was performed. These physical activities include aerobic dance, resistance training, and flexibility training. The physical fitness effect is better felt after the exercise is performed compared to before the exercise is performed.

The majority of the public has come to realize that exercising can improve the level of health, yet there are still a lot of people that do not understand that a well-conducted, scheduled, and regular exercise can manage physical fitness which is important to control overall stamina. An incredible level of physical fitness can reduce the risk of being contracted by disease. The declining number of diseases in the workplace shows that the level of attendance of the worker is improving, this elevates the level of productivity (Ministry of Health, 2015).

Undang Undang Republik Indonesia No. 36 Tahun 2009 about Health in Chapter XII of Occupational Health Article 164-166 explains that the effort of occupational health is aimed to protect workers to live healthily and to be freed of health problems and also any side-effects that might be inflicted caused by the jobs. The effort in occupational health is directed to protect workers in both formal and informal sectors and applies to everyone especially for the workers in the work environment.

PT Petrokimia Gresik is a subsidiary of State-Owned Corporation or Badan Usaha Milik Negara

(BUMN) which is PT Pupuk Indonesia Holding Company (PT PIHC) which is under the Ministry of Industry and Trade. The fertilizer-producing company that supplies 50% of the nationally subsidized fertilizer needs and has over 40 variety of products, be it fertilizer or non-fertilizer. The fertilizer products that the company have includes PHONSKA, Superhos, Urea, ZA, Petroganik, TSP, SP-36, ZK, KCL, Ammonium Phosphate, and Petrobiofertil, while the non-fertilizer products are self-produced chemical ingredients which include: Ammoniac, Sulfuric acid, Phosphoric acid, Gypsum, Nitrogen, liquid CO₂, Hydrochloric acid, Agricultural lime, Agricultural gypsum, and Petroseed (premier paddy seeds).

The effectiveness and efficiency of a company to reach a goal is heavily influenced by the health of the labor. The health evaluation test performed on the employees of Petrokimia Gresik in 2018 showed that only 51% of employees had good physical fitness, while the other 37.8% had an average physical fitness, and the rest of the employees (11.2%) were not tested due to illness or pregnancy. Besides the physical fitness problem, a metabolic disorder such as lipid profile abnormality was starting to be found in young employees caused by a lack of activity and inappropriate consumption patterns. The percentage of the fit-with-note employee was at a 51.5% rate, while the fit-to-work employee was only around 46.2%. The lack of health performance will directly impact on the illness absence rate. Around 58% of employees were absent from work caused by illness for more than 1 day, while the other 42% of employees were sick for 1 day accompanied by the doctor's notice.

The objective of this research was to understand the contributing factors that can affect the physical fitness of the employees that are actively involved in physical exercises in PT Petrokimia Gresik. This research focused on the employees' internal factors, such as age, working period, and exercise frequency. Besides that, this research also suggests the improvement of the physical fitness of the employees by educating them about the importance of healthy living and to keep up this healthy living patterns by maintaining physical fitness, one of which is by normalizing daily exercise as a routine.

Choosing the right kind of exercise does not need special preparation and can be done by all productive ages, which is why walking or jogging is often found as the best choice (Husdarta, 2012). Walking and jogging are considered aerobic

exercise, a type of exercise that requires oxygen. Both walking and jogging not only improve health but also increase fitness levels. Fitness improvements would be seen as the heart's ability to pump blood, increased muscle size, and flexibility. For the most part, walking and jogging in this text is viewed in the context of exercise (Flynn et al., 2018).

METHODS

This research was categorized as non-reactive and unobstructed research because some individuals in this research did not realize that they were part of the study. The data used in this research was secondary. Based on the time observation, this research was a cross-sectional study because it was conducted during a certain period. The population of this research with inclusion criteria that was the employees of PT. Petrokimia Gresik had previously done medical check-up after physical exercise for more than 24 activities with a minimum of 126 km within 3 months which amounted to 90 employees. The research subject was gathered by using a simple random sampling technique which amounted to 55 employees. This research was conducted at PT. Petrokimia Gresik, Kebomas sub-district, Gresik District, East Jawa in December of 2019.

The data were grouped based on the individual characteristics that cover the age value, gender, work period, work system, and exercise frequency. The overall data was then assembled by using PT. Petrokimia Gresik internal data, Global Positioning System (GPS) application that records exercise rate, and medical check-up results. The independent variables observed were age, work period, and employees' exercise frequency. The age category in this research was divided into two criteria, which were the young adult (21-29 years old) and average adult (30-58 years old) (Abadini and Wuryaningsih, 2019). The working period was divided into two criteria, which is new if the individual has been working for 1-3 years, and old, if the individual has been working for more than 3 years in the company (Trinofiandy, Kridawati and Wulandari, 2018). Exercise frequency can be categorized into good, if the exercise is performed at least 3 times per week and less, if the exercise is performed less than 3 times every week (Ministry of Health, 2015).

The dependent variable in this research was the physical fitness measured by using ergocycle during a periodical medical check-up. During ergocycle test, the subject was stationarily cycling for six minutes with the addition of specific and

gradual loading. The parameter on this test was the pulse frequency and the size of the load, which is done to determine the VO₂ max (maximal oxygen consumption) rate. The physical fitness category based on the ergocycle test was then determined as good, average, and weak. The physical fitness was categorized as good if the subject finishes the test for 6 minutes and has less than 50 and up to 116 pulses per minute. The physical fitness is categorized as average if the subject finishes the test for 6 minutes and has more than 116 pulses per minute. Physical fitness is categorized as weak if the subject cannot finish the test for 6 minutes (Nainggolan, Indrawati, and Pradono, 2018).

This research has achieved the ethical test certificate from the Ethical Public Health Research Commission of Universitas Airlangga Surabaya with an ethic code of 06/EA/KEPK/2020. The data processing technique used in this research was the data obtained and processed with the help of statistic software and presented in the form of an analysis-ready table.

The data analysis was done descriptively and the correlation test was done to monitor the connection between individual characteristic variable physical fitness. The statistic test used in this research was Chi-Square with a confidence level of 95% and a significant value or α at 5%. The Chi-Square test requirement was fulfilled if there were no cells that had an expectancy-value of less than 5 and have no more than 20% percentage rate. If the requirements were not fulfilled, then Fisher's exact test value needs to be considered. Both of the variables were related if the significant level is at ≤ 0.05 , meaning that the Ho value was rejected and the Ha value was accepted.

RESULT

The result of this research was obtained by using individual characteristics (age, sex, work period, working system, exercise frequency) and employee's physical fitness. The distribution of variables can be seen in the table and the explanation below.

Individual Characteristics

Age

Table 1 shows that 54.5% of the employees that had performed medical check-up after the first three months period exercising was the average

adult, which is at the age between 30-58 years old. The young adult employees, which was at the age between 21-30 years old was less in number compared to the average adult. This means that the average adult employees tend to be more active in doing physical exercise in the company.

Sex

Gender is commonly used to identify the difference between males and females by their biological anatomy. Based on table 2, it can be seen that the majority of the employee that conducts in exercise was male by 98.2%, while only 1.8% female that has conducted physical exercise. This shows that male employees were more active in doing physical exercise in the company.

Work Period

Working Period was divided based on the length of the respondent's work, counted from the first time the respondents work in the company up until the

Table 1. Age Distribution of the Employee who Performs in Physical Exercise Activity at the Fertilizer Company in 2019

Age	Frequency (n)	Percentage (%)
Young Adult (21-29 years old)	25	45.5
Average Adult (30-58 years old)	30	54.5
Total	55	100.0

Table 2. Employee's Gender Distribution who Performs in Physical Exercise Activity at the Fertilizer Company in 2019

Gender	Frequency (n)	Percentage (%)
Male	54	98.2
Female	1	1.8
Total	55	100.0

Table 3. Employee's Working Period Distribution who Performs in Physical Exercise Activity at the Fertilizer Company in 2019

Working Period	Frequency (n)	Percentage (%)
New (1-3 years)	19	34.5
Old (>3 years)	36	65.5
Total	55	100.0

moment the research is conducted. Based on table 3, the majority of the employee that has done medical check-up after the first three months involved in exercise activity at 2019 had more than 3 years of the working period by 65.5%. The worker with 1-3 years of working period had an attendance rate of 34.5% in attending the exercise activity at the company.

Working System

Based on table 4, it can be seen the company had 2 working systems, which were normal day system and shift system. The normal day working system has an 8-hour work duration that starts from 07.00 am up to 04.00 pm with 1 hour of rest in-between. The shift working system was divided into three, which are morning (07.00 am up to 03.00 pm), evening (03.00 pm up to 10.00 pm), and night shift (10.00 pm up to 07.00 am). Based on this research, 76.4% of the employees that were involved in physical activity had a normal day working system, while the rest (23.6%) was the shift-workers.

Exercise Frequency

Table 5 shows the employees' exercise activity was recorded by the Strava GPS application. In table 5, it can be seen that the employee that exercised less than 3 times a week was at 43.6%. This shows that the majority of the employee (56.4%) had a good exercise habit with the minimum frequency of at least 3 times a week. The entirety of the employee

Table 4. Employee's Working System Distribution who performs in Physical Exercise Activity at the Fertilizer Company in 2019

Working System	Frequency (n)	Percentage (%)
Normal day	42	76.4
Shift	13	23.6
Total	55	100.0

Table 5. Employee's Exercise Frequency Distribution who performs in Physical Exercise Activity at the Fertilizer Company in 2019

Exercise Frequency	Frequency (n)	Percentage (%)
Good (≥ 3 times/week)	31	56.4
Less (< 3 times/week)	24	43.6
Total	55	100.0

has done more than 24 activities with a minimum of 126 km runs within 3 months.

Physical Fitness

Physical fitness was calculated by using ergocycle test for 6 minutes during the medical check-up in 2019. In table 6, it can be seen that around 78.2% of employees involved in physical exercise had a good physical fitness level and the rest 21.8% had an average physical fitness level. This shows that the majority of the employees have good physical fitness.

Correlational Analysis

Age

Table 7 shows that 53.5% of the good physical fitness level was felt by the young adult employees, which was within the age of 21-29 years old. Meanwhile, 83.3% of the average physical fitness level was felt by the average adult employees (30-58 years old). Based on the statistical test result, Pearson Chi-Square showed a value of 0.024 compared to the α value of 0.05. The p-value of 0.024 is smaller than α , meaning that there was a correlation between the age and physical fitness of the employees at the Fertilizer Company.

Table 6. Employee’s Physical Fitness Distribution who performs in Physical Exercise Activity in the Fertilizer Company in 2019

Physical Fitness	Frequency (n)	Percentage (%)
Good	43	78.2
Average	12	21.8
Total	55	100.0

Table 7. The Correlation between Age Value with the Employee’s Physical Fitness at the Fertilizer Company in 2019

Ages (Years)	Physical Fitness				p-value
	Good		Average		
	n	%	n	%	
Young Adult	23	53.5	2	16.7	0.024
Average Adult	20	46.5	10	83.3	
Total	43	100.0	12	100.0	

Work Period

Based on table 8, it can be seen that 41.9% of good physical fitness level was felt by the employees in the new working period category of 1-3 years, while 91.7% of the average physical fitness level was felt by the employees in the old working period category (longer than 3 years). Based on the statistical test result, the chi-square test score cannot be used because it has the expected value of more than 20%, therefore Fisher’s exact test was used and it resulted in the p-value value of 0.029. Compared to the α value of 0.05, the p-value (0.029) is smaller than α , meaning that there was a correlation between the work period and the physical fitness of the employees at the Fertilizer Company.

Exercise Frequency

Based on table 9, it can be seen that 60.5% of good physical fitness level was felt by employees that were involved in physical activities at least 3 times a week. Additionally, 58.3% of the average physical fitness level was felt by employees with less than 3 times of exercise frequency per week. The correlation test analysis between exercise frequency and physical fitness by using the chi-square test resulted in a value of 0.246, which can be interpreted that there was no correlation between exercise frequency with the physical fitness of the employees at the Fertilizer Company.

Table 8. The Correlation between Working Period with the Employee’s Physical Fitness at the Fertilizer Company in 2019

Work Period (Years)	Physical Fitness				p-value
	Good		Average		
	n	%	n	%	
New	18	41.9	1	8.3	0.029
Old	25	58.1	11	91.7	
Total	43	100.0	12	100.0	

Table 9. The Correlation between Exercise Frequency with the Employee’s Physical Fitness at the Fertilizer Company in 2019

Exercise Frequency	Physical Fitness				p-value
	Good		Average		
	n	%	n	%	
Good	26	60.5	5	41.7	0.246
Less	17	39.5	7	58.3	
Total	43	100.0	12	100.0	

DISCUSSION

Individual Characteristics

The individual characteristic factor is a personal factor that differentiates each employee based on their age, working period, and exercise frequency.

Age

Age is the life span of employees calculated from the time workers were born until the study in 2019. An individual's maximum physical capability is obtained at the age of around 25-30 years old, however, the physiological capacity will gradually decline by 1% each year after his/her peak condition is exceeded (Tarwaka, 2015). This decline does not only happen to the muscles but also followed by the decrease in the capability of nerves and the five senses, followed by other organs' functions such as reactionary speed, hearing, and vision (Suma'mur, 2009).

Gender

Gender is generally used to identify male and female differences in terms of biological anatomy. Gender is a differentiator between men and women who concentrate more on social and cultural aspects (Suhardin, 2016). In this research female employees had a minority of frequency due to low self-confidence to exercise. The perception that women have weak stamina makes women reluctant to exercise regularly (Edmunds, Hurst and Harvey, 2013).

Work Period

The working period is the employee's working-related activity measured in a certain time unit. Furthermore, bodily exhaustion or problems might occur when the activity is done continuously or if it has been performed for many years. Physical pressure during certain periods might cause an improvement or a decline in muscle performance such as a visible decrease in movements. Daily physical and mental pressure on an individual may also cause health depletion or clinical/chronic fatigue (Pastuti and Martiana, 2017).

Working System

The working system was divided into 2 those are normal day system and shift system. Working systems can affect the mechanism of biological

clocks. The mechanism of biological clock or commonly called the circadian rhythm of each individual includes annual, monthly, daily cycles, until a cycle that repeats less than 24 hours can affect blood pressure regulation, hormonal levels, body temperature, and sleep wake cycles (Rusydia, 2018).

Exercise Frequency

Exercise frequency is the number of exercise activities conducted in one week. Physical fitness is influenced by the physical activity and exercises that an individual does. The effect of training will provide a physiological change in body systems. The change will be achieved if it meets the required time necessary for physiological adaptation, which is around 6 to 8 weeks. Physical training or exercise will have a lasting positive impact on cardiac functions (Artanty and Lufthansa, 2017).

The Correlation between Age and Physical Fitness

The older an individual gets, the body's ability to self-repair and maintain its normal function will gradually decrease, rendering it vulnerable to infections and making it hard for the body to repair the damage. Physical capacity will keep on declining at the age of over 30 years old (Rahmawati, Suroto, and Wahyuni, 2016).

In this research, employees who are younger than 30 years of age were more active in performing exercise activity compared to the older counterpart. Syarif (2012) explained that age factor affects the level of physical fitness of an individual because the older he/she gets, the less the physical activities he/she can manage and more time will be spent to work instead. This goes to show that the level of physical fitness is highly related to the age factor.

The analytical result in this research showed that there was a correlation between age and physical fitness. Around 53.5% of good physical fitness was felt by the employees categorized as a young adult, which is in conjunction with the research conducted by Bryantara (2016), explaining that there was a strong correlation between age and physical fitness based on cardiopulmonary. The risk value analysis result showed that the physical fitness risk based on cardiopulmonary or VO₂ max at age around 18-35 had physical fitness level 42 times higher compared to the age around 35 up to 45 years old.

In research conducted by Ani (2012), it was explained that aging lowers the physical fitness of a

person by an average of 8-10% per decade for daily inactive individuals or those without proper exercise habits. The heart and lungs resistance will peak at the age of around 20-30 and will keep on declining by 0.1%-1% every year after 30 years of age. The declining heart contraction, cardiac muscle mass, and lung's total capacity are the contributing factor in this downgrade.

Age factor is a very important factor due to its correlation with one's physical and mental strength. The muscular strength in male and female peaks at the age of 25-35, while at the age of 50-60 years, the muscular strength declines around 15%-25% (Setyawati, 2010). The change of internal body function causes decline over time, and this process is simply unavoidable, unpreventable, and non-rejectable. The change due to old age often includes; decreasing energy consumption, immune system, falling teeth, and cardiovascular system degradation (Prabowo, 2014).

Older labor needs more energy reserves for recovery, causing them to get easily fatigued and other negative health issues. Aging brings along some physiology and cognitive changes, this can be further understood by knowing the decline in physical capacity (which includes fitness, muscle strength, and flexibility), and other signs of depleting health fitness once a certain individual ages over 50 years of age (Mackey et al., 2007).

The Correlation between Working Period and Physical Fitness

The working period is highly related to the ability to adapt between workers and their assignments or workplace. The adaptation process may cause additional side effects, such as the breaking of the immune system limit received during the work. Moreover, the working period length will impact the worker's stamina and degrade the immune system (Atiqoh, Wahyuni, and Lestantyo, 2014).

The results showed that the majority of 55 employees at the Fertilizer Company who performed medical check-up after the first three months period exercising had a working period over 3 months and 41.9% of them had an average level of physical fitness. The employees with a longer working period would determine the behavior and response of the company, especially in assignments in which those employees were responsible, thus making them more contributive towards the company (Purnomo and Suhendra, 2020).

Based on this research, it can be stated that there was a correlation between work duration and physical fitness. This, however, has different results in comparison to the research conducted by Rahmawati, Suroto, and Wahyuni, (2016) which claimed that there was no correlation between the working period and the level of physical fitness on porters. In her case, the working period created working patterns that shape the workers' habits. This working period left an impact on the improvement of muscular endurance and affects workers' physical fitness.

The difference of results in both of those research was caused by the difference in research object and measurement location. In that research on particular Rahmawati, Suroto, and Wahyuni (2016), the subject of their study were workers that were required to have a specific physical strength. The workers' muscle has to be durable to execute their daily tasks and assignments. Furthermore, lifting and transporting dozens of kilograms-worth of stuff were part of their job and it helped to build their muscle strength. Therefore, the workers were accustomed to lifting heavy objects, meanwhile, in this research, the majority of the workers were Fertilizer Company employees that work in day and night office shifts.

The Correlation Between Physical Exercise Activity and Physical Fitness

Jogging is an aerobic exercise known for its cardiovascular exercise that can improve lung function, heart function, and blood circulations. The further benefit of this exercise is so that the body can maximize the oxygen usage to perform cell metabolism and improve the VO2 max (Oklian Firman Bryantara, 2016). Internal improvement such as the quality of the heart can be measured from the decreasing pulse number per minute during rest/break period. Relevant exercise to improve the previously mentioned internal quality is a low-intensity exercise performed in extended time (Prativi, Soegiyanto, and Sutardji, 2013).

The result of the research conducted on 55 employees who performed exercise activity showed that the majority of employees exercise more than 3 times every week. Statistical analysis showed that there was no correlation between exercises with physical fitness. This result is in conjunction with the research conducted by Ferdianto (2017) on the 8th-grade students of SMP Negeri 2 Candi which

also shows that there was a significant correlation between daily physical activities and the physical fitness level. Additionally, Sutri (2014) stated that the connection between physical activity and the physical fitness level does not occur because negative effects will arise when the number of activities performed is too much or is performed beyond the allowed limits.

In this research, the study was conducted without monitoring the exercise frequency of each employee and also without considering the duration and the intensity of the exercise. Nurhassan (2011) explained that exercise can improve physical fitness, if it fits certain criteria, such as 1) Training intensity, related to the weight of the physical activity and is the primary factor that can influence the body functions, 2) Training frequency, related to the number of physical activity done in a week, and 3) Training duration, which is the length in which the exercise is performed.

The good training exercise is the one that can combine the level of both frequency and intensity well. If the training frequency is high, then a low training intensity should be the one performed, and otherwise. If this combination can be adjusted perfectly, then an improvement as the intended effect of the exercise can be achieved (Tirtawirya, 2012).

Utomo (2012) explained that exercising at least 3 times in an extended duration every week for a month can help to improve the maximum VO₂ capacity and physical fitness. This difference happened because the exercise was given regularly and is performed with certain intensity, frequency, and duration. The more activity and training exercise that an individual does, the better his/her physical fitness level is. Routinely performed physical exercises can maximize oxygen consumption the body needs to perform, this resulted in a better physical fitness level overall (Sepriadi, Hardiansyah, and Syampurna, 2017).

Routinely performed physical exercises will enable the blood circulations to flow smoothly and quicken the process of metabolism residue release. The better an individual recovery is, the more durable the body's performance is to resist fatigue after performing works, enabling said individual to work on other tasks (Palar, Wongkar, and Ticoalu, 2015). It is often recommended to perform around 3 and 4 exercises in a week. Doing too much, too soon, will almost certainly lead to burn out, severe fatigue, and injury. This happens because even though cardiac muscle can be trained multiple

times per day, over-exercising can damage the heart instead (Flynn et al., 2018). At least 48 hours (2 days) are required for the cardiac muscle to recover, and giving recovery time for the body to rest can strengthen and improve the muscle-work, resulting in a better and more desirable physical fitness within expectation (Amirudin, 2011).

Fahruzi, Nuriatin, and Rusman (2017) explained that there was a significant difference towards VO₂ max between performing exercise twice a week and four times a week on seven weeks time limit. This explanation is also supported by the increase of VO₂ averages difference for before and after the seven weeks exercise performance was conducted. Both compared activities, twice and four times a week varied significantly due to the training frequency, the level, and the intensity of the physical activities. For example, lengthy bed-rest can decrease VO₂ max between 15%-25%, while intense physical training will increase the VO₂ max by the same rate (Nosa and Faruk, 2013).

Exercising can also increase and maintain cardiorespiratory resistance or aerobic fitness. Training is an act of exercise that is done with low-average intensity and can be done continuously within an extended period. This includes walking, cycling, or jogging (Irawan, 2007). To achieve a good level of physical fitness, jogging with a minimum of 1.5 months can be performed which will result in a fitness improvement of 35%. Likewise, performing regularly for more than 2 months will also result in an elevated level of physical fitness (Wibowo, 2018)

Sulastri, Mariati, and Syamsuar (2018) explained that jogging with the help of a treadmill for 16 times will have a significant amount on resting pulse rate. Normally, resting will cause the pulse rate to go slower, resulting in a longer recovery time of the heart, making it to pump and circulate blood in higher amount. Pulse frequency can be used as a parameter to see the ability of physical conditions, both in a state of rest, during exercise, and after exercise, The change in pulse can be concluded with an increase in physical ability due to physical exercise. An individual with a low resting pulse is relatively more fit than those with a higher resting pulse (Bafirman and Wahyuri, 2019).

Safaei et al., (2014) explained that jogging in the workplace can elevate the level of physical fitness on the body. This escalation helps the well-being of both the physical and mental health for executing the job. In conclusion, the workplace all

around Indonesia is required to pay more attention to expand training programs and to provide training facilities around the working area to help to increase the level of physical fitness for the employees.

CONCLUSION

The majority of the employees that has performed exercise and medical check-up after the first three months research has good physical fitness (68.9%). The majority of the employees are 30 years of age or younger, have a working period around 6-10 years, and have a frequency of exercise for at least 3 times a week. It can be concluded from the research that there is a correlation between both age value and working period towards physical fitness. However, there is no correlation between the frequency of exercise and physical fitness because the intensity and duration of the fitness are not studied and included for this research.

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