

# CHAPTER I

## INTRODUCTION

### 1.1 Background

Occupational fatigue is a condition in which the body, both physically and mentally, experiences a decrease in productivity and endurance when working. Work burnout is a serious problem in a global work environment with a fairly high incidence rate.<sup>1</sup> Based on data from the International Labour Organization (ILO),<sup>2</sup> around 32% of the world's workers experience fatigue due to workload, with severe fatigue experienced by 18.3% to 27% of workers.<sup>3</sup> This condition risks reducing productivity and increasing the likelihood of work accidents. In fact, an estimated 2.78 million workers die every year due to work-related illnesses and accidents.<sup>4</sup>

In Indonesia itself, work fatigue is a significant problem that affects workers in Indonesia, contributing to 50% of work accidents.<sup>5</sup> Factors contributing to work fatigue include excessive workload, poor sleep quality, nutritional intake, long work duration, and smoking habits.<sup>6</sup> To overcome this

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<sup>1</sup> Suma'mur, Corporate hygiene and occupational health (Hiperkes), 2 ed., vol. 1 (Jakarta: Sagung Seto, 2013).

<sup>2</sup> International Labour Organization, "Improving the Safety and Health of Young Workers" (Geneva, 2018).

<sup>3</sup> H. M. Hasan et al., "The Relationship Between Workload and Work Fatigue in Production Workers at Pt. Tri Teguh Manunggal Sejati, Tangerang City," *Journal of Health Research Science* 2, no. 01 (June 9, 2022): 1–8, <https://doi.org/10.34305/jhrs.v2i1.478>.

<sup>4</sup> L.K.R. Puji et al., "The Correlation of Individual and External Factors to Work Fatigue in Employee at PT. Hutama Karya Building Division Project, Integrated Building Soekarno Hatta Airport Train Station," *HEME: Health and Medical Journal* 4, no. 2 (May 2022): 2685–2772, <https://jurnal.unbrah.ac.id/index.php/heme/issue/view/42>.

<sup>5</sup> Annisa Agustin, Taufiq Ihsan, and Resti Ayu Lestari, "An Overview of Factors Affecting Work Fatigue in Textile Industry Workers in Indonesia: A Review," *Journal of Safety, Occupational Health and Environment (JK3L)* 2, no. 2 (2021): 138–51, <http://jk3l.fkm.unand.ac.id/>.

<sup>6</sup> Fenita Purnama Sari, Mutiara Ramadani, and Andriyani Rahmah Fahriati, "Workload Analysis of Cardiovascular Load Method with Work Fatigue in Workers," *Journal of Midwifery Care* 2, no. 02 (June 9, 2022): 122–32, <https://doi.org/10.34305/jmc.v2i2.480>.

problem, companies are advised to adjust their workload to the capacity of employees, provide sufficient rest time, and conduct periodic health checks.<sup>7</sup>

The convection industry is one of the industries that is mushrooming in Indonesia, so there are a lot of convection industries starting from the middle to lower criteria, some are even at the level of large industries on a national scale. However, behind the mushrooming of the convection industry, there are a lot of company losses caused by the decline in the productivity of its workers. This decrease in productivity occurs due to work fatigue that occurs to workers.<sup>8</sup> And plus the lack of alertness of business owners in handling the case.

A study shows that in the convection industry, the sewing part belongs to CV. Aneka Garment Gunungpati Semarang, most of the respondents, which is around 71%, experienced severe work fatigue after finishing work. This shows that the level of fatigue experienced by workers is quite high in this industry.<sup>9</sup> This situation is exacerbated by the existing work system in the convection sector of the Pondok Modern Darussalam Gontor business unit, where the work system used is a wholesale work system. The wholesale work system itself is workers who have worked for a certain employer or company and receive a salary based on the volume of their work or the unit of result for their work.<sup>10</sup> In other words, the implementation of this system will allow a worker to receive wages according to the results of their respective work. So that there will be an attitude of wanting to pursue the target to generate as much

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<sup>7</sup> Suwaibatul Maswah, Kimberly F. Kodrat, and Wirda Novarika AK, "Analysis of Work Fatigue in Production Section Employees at PT Sinar Sosro Medan," *Factory Journal of Industry, Management and Industrial System Engineering* 2, no. 2 (May 16, 2024): 79–88, <https://doi.org/10.56211/factory.v2i2.411>.

<sup>8</sup> EkoHaris Adrianto and DinaNur Anggraini Ningrum, "The Relationship Between Physical Fitness Level and Nutritional Status with Work Productivity," *Journal of Public Health* 5, no. 2 (2010): 145–50, <http://journal.unnes.ac.id/index.php/kemas>.

<sup>9</sup> Januar Atiqoh, Ida Wahyuni, and Daru Lestantyo, "Factors Related to Work Fatigue in Convection Workers in the Sewing Section in CV. Aneka Garment Gunungpati Semarang," *JOURNAL OF PUBLIC HEALTH* 2, no. 2 (2014): 119–26, <http://ejournal-s1.undip.ac.id/index.php/jkm>.

<sup>10</sup> Jalilut Jabar, "The Effectiveness of Wholesale Work in Increasing Productivity at Pt Manggala Citra Mandiri (Mcm) Tulungagung" (TULUNGAGUNG STATE ISLAMIC RELIGIOUS INSTITUTE, 2021).

wages as possible, and in the end the workers will ignore the condition of their bodies as a result of the ambition to pursue the target as much as possible. Compounded by the control of the employer cannot run optimally, it is undeniable that work fatigue must occur.<sup>11</sup>

Work fatigue can be prevented through various ways, one of which is by paying attention to the nutritional intake of workers. Lack of nutritional intake in workers not only causes a decrease in health but will also have an impact on reducing the level of productivity in workers.<sup>12</sup> In this case, the nutritional intake that is suitable for work in the convection industry is vitamin B12, where vitamin B12 plays a role in increasing the production of red blood cells (hemoglobin) by increasing iron production (zinc). Red blood cells are needed by the body to metabolize various important molecules so that energy burning is faster. With the increase in the production of red blood cells, the distribution of oxygen to the brain will be fulfilled. So that the level of concentration and vigilance in workers will also be maintained. Thus, vitamin B12 is able to increase energy which indirectly prevents the body from experiencing *fatigue*.<sup>13</sup>

With the benefits of vitamin B12 which can increase the production of red blood cells and can increase energy, there are even studies that state that vitamin B12 can improve cognitive ability and improve mood.<sup>14</sup> By providing Vitamin B12 supplement intake to workers, it is hoped that it can increase concentration and alertness so that it can reduce the level of work fatigue that

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<sup>11</sup> Mary E Davis, "Does Piece Rate Pay Impact Perceived Occupational Hazards in Garment Factories?" (Vietnam, June 2018), [www.ilo.org/publns](http://www.ilo.org/publns).

<sup>12</sup> Daniel Tasmi, Halinda Sari Lubis, and Eka Lestari Mahyuni, "The Relationship between Nutritional Status and Energy Intake and Work Fatigue in Workers at PT. Nusantara Plantation I Pulau Tiga Oil Palm Mill in 2015," *Journal of Environment and Occupational Health* 4, no. 2 (2015): 22–27.

<sup>13</sup> Anne Laure Tardy et al., "Vitamins and minerals for energy, fatigue and cognition: A narrative review of the biochemical and clinical evidence," *Nutrients* 12, no. 1 (January 1, 2020), <https://doi.org/10.3390/nu12010228>.

<sup>14</sup> A. Pipingas et al., "The effects of multivitamin supplementation on mood and general well-being in healthy young adults. A laboratory and at-home mobile phone assessment," *Appetite* 69 (October 1, 2013): 123–36, <https://doi.org/10.1016/j.appet.2013.05.016>.

occurs, as well as prevent mistakes and accidents at work caused by work fatigue.

This study aims to determine the effectiveness of a vitamin B12 supplement in reducing fatigue levels. The broader benefits of this study can be a further recommendation for occupational health policies or programs in companies to recommend vitamin B12 as an additional supplement to the occupational nutrition menu.

## **1.2 Problem Formulation**

Based on the background that has been described, the formulation of the problem in this study is "Is the Administration of Vitamin B12 Supplements Effective in Reducing the Level of Fatigue in Workers at the Convection of Pondok Modern Darussalam Gontor?"

## **1.3 Research Objectives**

### **1. General Purpose**

To analyze the effectiveness of the use of vitamin B12 supplements in reducing worker fatigue levels.

### **2. Special Purpose**

- a. To measure the level of fatigue in convection workers of Pondok Modern Darussalam Gontor before the administration of Vitamin B12.
- b. To measure the level of fatigue in convection workers of Pondok Modern Darussalam Gontor after the administration of Vitamin B12.
- c. Compare worker fatigue levels before and after administration of Vitamin B12 supplementation to assess its effectiveness.

## **1.4 Research Benefits**

### **1. For Authors**

It can analyze the effectiveness of the use of vitamin B12 supplements in reducing worker fatigue levels, as well as applying scientific fields.

**2. For Study Programs**

The results of this research can be an addition to the Library collection, especially within the Occupational Safety and Health Study Program.

**3. For convection of Pondok Modern Darussalam Gontor**

It can be known the importance of providing adequate nutritional intake in the form of vitamin B12 to workers to increase their productivity.

**4. For the Community**

As input and reference material for the community at large, about the effect of Vitamin B12 in reducing work fatigue levels, as well as the importance of maintaining nutritional intake for the body.

## 1.5 Originality of Research

This study refers to several previous studies that have similar topics, including:

**Table 1. 1** Previous Research

No.	Research Title	Name and Year	Design Research	Variable	Result	Difference
1	Effect of Vitamin B1, B6 and B12 Administration on Muscle Fatigue in Perbasi Basketball Athletes of Sinjai Regency. <sup>15</sup>	Servant (2019)	PreExperimental <i>Correlational Research</i>	- Vitamins B1, B6 and B12 - muscle fatigue	There is a significant effect of vitamin B1, B6, and B12 administration on muscle fatigue in Perbasi basketball athletes	The research will focus on Vitamin B12 and analyze the effectiveness of Vitamin B12 in reducing work fatigue levels
2	Effect of B1, B6, and B12 Multivitamin Supplements on Work Fatigue in Shift	Josua Tumpal Halomoan, Rasmi Zakiah, TA Larasati (2020)	pseudo-experimental analytics research	- Multivitamin B1, B6, and B12 supplements - Work Fatigue	There was a difference between before and after multivitamin B1, B6 and B12 supplementation on work fatigue both subjectively and objectively in Shift workers.	The research will focus on Vitamin B12 and analyze the effectiveness of Vitamin B12 in reducing work fatigue levels

<sup>15</sup> Mukhlis Abdi, "The Effect of Vitamin B1, B6 and B12 Administration on Muscle Fatigue in Perbasi Basketball Athletes in Sinjai Regency" (MAKASSAR STATE UNIVERSITY, 2019).

Workers in Cooking Oil Packaging Plants. <sup>16</sup>						
3	Effect of Multivitamin B1, B6, and B12 Supplements on Work Fatigue in Shift Workers at Oil Packing Factor. <sup>17</sup>	Josua tumpal halomoan (2017)	Pseudo-experimental research with <i>one group pre-test post-test design</i>	- multivitamin supplements B1, B6 and B12 - Work fatigue	The effect of multivitamin B1, B6, and B12 supplementation on subjective work fatigue in shift workers was a decrease in the average questionnaire score after supplementation of B1, B6, and B12 (p=0.001).	The research will focus on B12 supplements and analyze the effectiveness of Vitamin B12 in reducing levels of work fatigue
4	The effectiveness of vitamin B1, B6, B12 administration on reducing fatigue levels in chronic kidney disease patients	Maria Christina Prabowo (2019)	Pseudo-Experimental with <i>One Group Pretest - Posttest Research Design</i>	- Vitamins B1, B6, and B12 - Fatigue	Vitamin B1 Administration. B6 and B12 may lower fatigue levels in chronic kidney disease patients undergoing hemodialysis	The research will focus on B12 supplements and analyze the effectiveness of Vitamin B12 in reducing levels of work fatigue

<sup>16</sup> Josua Tumpal Halomoan, Rasmi Zakiah, and T A Larasati, "Effect of B1, B6, and B12 Multivitamin Supplements on Work Fatigue in Shift Workers in Cooking Oil Packaging Factories," *Medula* 9, no. 4 (2020): 712–19.

<sup>17</sup> Josua Tumpal Haloman, "Effect Of Multivitamin B1, B6, And B12 Supplements On Work Fatigue In Shift Workers At Oil Packing Factory" (University of Lampung, 2017).

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hemodialysis.<sup>18</sup>

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<sup>18</sup> Maria Christina Prabowo, "The Effectiveness of Vitamin B1, B6, B12 Administration on Reducing Fatigue Levels in Chronic Kidney Disease Patients Undergoing Hemodialysis" (DUTA WACANA CHRISTIAN UNIVERSITY, 2019).