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Relationship between Nutritional Status, Diet, and Calorie Adequacy on Work Fatigue of Female Pottery Crafters in Karanganyar Village, Borobudur, Magelang

Hubungan antara Status Gizi, Pola Makan, dan Kecukupan Kalori terhadap Kelelahan Kerja Pengrajin Gerabah Perempuan di Desa Karanganyar, Borobudur, Magelang

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ABSTRACT

Background: Work Fatigue is a common condition often experienced by workers characterized by decreased work performance. Work fatigue can be caused by poor nutritional status, diet and calorie intake received by workers.
Objectives: This study purpose is to analyze the relationship between nutritional status, diet, calorie intake and work fatigue experienced by female pottery craftsmen in Karanganya Village, Central Java.
Methods: This research is a quantitative analytic research with cross-sectional study design. The study population was 70 female pottery artisans in Karanganyar Village, Borobudur District, Magelang Regency, Central Java. The number of samples taken was 43 people determined using simple random sampling. The variables studied were nutritional status, diet, calorie adequacy and physical labor fatigue. The instruments used were digital weight scales and staturemeter, Food Frequency Questionnaire, 24-hour food recall form and reaction timer. Data analysis techniques using SPSS with Chi-square test and logistic regression.
Results: 48,84% of pottery crafters have abnormal nutritional. 65.12% of pottery crafters have a good diet although 69.77% of the calorie adequacy of pottery crafters is not met. 34.88% of pottery craftsmen experienced physical fatigue in the moderate category and 4.65% experienced physical fatigue in the severe category. Based on the results of bivariate analysis, there is a relationship between diet (p=0.010), calorie adequacy (p=0.044) with physical work fatigue. There is no relationship between nutritional status (p=0.098) with physical fatigue.
Conclusions: Work fatigue experienced by female pottery crafters in Karanganyar Village is caused by diet and calorie adequacy deficits.

INTRODUCTION

Women who do not have sufficient education and skills tend to choose to work as labor in the informal sector. This is because, in addition to not requiring high education and skills, working in the informal sector is also considered to have sufficient working time to suit women's busy lives, so that women workers still have time to take care of their families[1]. Mothers from low-income families generally play a dual role because of the demands of living for the family. Although the husband is obliged to be the main breadwinner in the family, this does not rule out the possibility for wives to work as a family income enhancer and of course to aim to achieve a level of welfare[2]. On the one hand, they are required to be able to excel by increasing work efficiency and productivity, while on the other hand, as housewives, they have a role in realizing and developing a healthy and prosperous family.

Occupational health in the informal sector has not received optimal attention because it is non-formal and has no legal entity. Occupational health is an independent matter, informal sector workers must obtain proper knowledge about safety and health at work. Work fatigue is one of the most health problems that often experienced by informal sector workers. Physical and psychological fatigue are the two basic forms of occupational fatigue. Work fatigue characterized by reduced work performance such as tiredness, lethargy, confusion, frustration, headaches, joint and muscle pain. Work fatigue can be the cause of the occurrence injury, and accident at work[3].

Magelang Regency as one of the regions in Indonesia that is developing with its tourism provides

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many informal sector jobs for women. One of the informal sector jobs is as a pottery craftsman. The division of labor in the pottery making process is dominated by women. Meanwhile, men only help during the firing process and tend to do marketing distribution. This is influenced by the community's view that working at home is better done by women. Women artisans, who are generally over 40 years old, directly have a dual role, working from home as artisans and doing housework as housewives[4]. Pottery craftsmen in Karanganyar Village generally have activities in production activities and pottery learning tourism. Pottery production activities begin with preparing clay, forming pottery, adding carvings, sun-dried, drying with an oven or burning, coloring, and storage. The working hours of production activities are not bound by certain provisions, the average worker starts production activities at 8am. The average duration of work is 9 hours per day including breaks, but at certain times when demand is high the working time can be more than that. During breaks, workers use their time to stretch, pray, and eat lunch. In the pottery industry in the village of Karanganyar, Indonesia, potters have the freedom to bring their own lunch or buy food around the workplace. Employees can prepare lunch from their homes before work, or they can decide to buy food from a nearby food vendor. As potters engaged in both production and tourism activities, employees have flexibility in their time arrangements, including lunch breaks. During the break, they can use their personal money to purchase the desired food from eateries available around Karanganyar village.

Fatigue is a common condition that workers often suffer from. About 20% of workers have symptoms of work fatigue[6]. Fatigue, of course, is associated with the work task being performed, and a particular work task depends on what demands it places on a person. Work is generally divided into physical and mental[7].

Work fatigue can be influenced by many factors such as age, gender, work environment, work intensity, psychological factors, food intake, illness and health status[8]. Food intake can affect a person's energy availability. The ability to work is strongly influenced by the nutritional status of a worker. Better nutritional status improves physical performance and reduces fatigue[9]. Female informal sector workers tend to have problems in diet and energy intake and nutritional status that can cause fatigue. Health-related factors such as worker nutrition that are likely to cause job fatigue[10]. Good nutritional status with calorie intake in the amount and the right time influences positive on worker performance. On the other hand, poor nutritional status, or excessive and inadequate calorie intake according to the amount and time cause low work resistance or slowing motion so that become a barrier to labor in carrying out their activities. It means if the caloric intake of labor is not according to need, then energy the work will be faster feeling tired compared to workforce with high calorie intake adequate. According to the study of Analysis of Relation between Life Style, Workload, and Work Stress with Metabolic Syndrome, lack of fruits consumption can contribute the metabolic syndrome case on government employees[11]. The diet, physical activity, and health-related workplace interventions reviewed in The effectiveness of nutrition and health intervention in workplace setting: A systematic review demonstrated a range of positive outcomes through improved knowledge and self-efficacy, behavioral changes, particularly in increasing fruit and vegetable consumption, reduce fat intake, avoid alcohol and drug use, then start eating a balanced diet[12].

Based on literature studies on several previous studies, namely research on the Gamelan Production Industry in Wirun Sukoharjo Village that there is a relationship between physical workload, nutritional status, hydration health status and work fatigue in workers in the informal sector[4,13]. In line with the research of relationship between nutritional status and fatigue in opak cracker makers in Kawedusan Hamlet, Ngadikerso Village, Semarang Regency who have abnormal nutritional status (both thin, obese and obese) coupled with working every day to make opak crackers to meet their daily needs[14].

Based on the data above, it is noted that many workers experience work fatigue. The author is interested in examining the relationship between diet, nutritional status and energy adequacy in female pottery crafters in Karanganyar Village, Central Java. In the context described above, the problem formulation in this study is the relationship between nutritional status, diet, and calorie adequacy with work fatigue among female pottery crafters in Karanganyar Village, Central Java.

In general, this study aims to determine whether there is a relationship between diet, nutritional status and energy adequacy with work fatigue among female pottery crafters in Karanganyar Village, Central Java.

METHODS

This study was conducted to determine the relationship between nutritional status, diet, caloric intake, and work fatigue in female potters from Karanganyar Village, Central Java using a quantitative analysis design with a cross-sectional approach. The survey was held in October 2022 at Karanganyar Village Hall, Magelang District, Central Java. The population of this study was 70 female potters in Karanganyar Village, Central Java. The sample is a fraction of the number and characteristics of the population, and the conclusions drawn from the sample apply to the population. We calculated the total number of tested samples using the Lemeshow formula. The formula indicated that the number of samples required for the study reached 43. The inclusion criteria included being willing to become research respondents, and not being in a state of illness while the exclusion criteria covered workers who did not work in the pottery making section at the time the research was conducted. A simple random sampling formula was used to determine the number of samples tested. This study's primary data are nutritional status, diet, calorie intake, and reaction time to detect physical fatigue status in female workers. Tools in this study were a food frequency questionnaire, a 24-hour food recall questionnaire, a staturemeter, a digital weight scale, and a reaction timer.

After all data were collected, data analysis was performed. Researchers analyzed the data in several stages. The first step is to check the integrity of the data.

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Data collected on food recalls were analyzed as part of the Nutri Survey 2007 program. Assessment of the frequency of use of food ingredients is used to obtain data on the frequency of consumption of several food ingredients or processed foods during a certain period such as days, weeks, months, or years and then given a score for assessment and categorization. The average score is determined using the Guttman Scale. Determination of the level of diet based on the number of scores obtained by each sample. Good diet, if the calculation score is equal to or above the average value of all respondents. To determine calorie needs, calculations are made using the Basal Metabolic Rate (BMR). The comparison between the respondent's food energy consumption in calorie units and work energy needs is calculated by the formula: BMR= 655+9.6 Weight + 1.8 Height - 4.7 Age. The comparison between daily consumption and BMR will be categorized into 3 categories: Deficit if Less than 90%, Adequate if 90%-110% and Excessive if More than 110%. The level of fatigue experienced by workers is measured by reaction timers which can be categorized into 4 categories: normal (reaction time 150.0-240.0 milliseconds), mild fatigue (reaction time >240.0-<410.0 milliseconds), moderate fatigue (reaction time 410.0-580.0 milliseconds) and severe fatigue (reaction time >580.0 milliseconds).

Using the SPSS 21.0 (Statistics Package for Social Sciences) program, all data variables were then analyzed. The analytical techniques used were univariate and bivariate analyses. We use univariate analysis to illustrate our findings. The research consisted of number distributions and percentages of respondent identities such as age, weight and height. Nutritional status divided into three categories: underweight, normal weight and overweight. Diet is divided into two categories: good diet and poor diet. Calorie adequacy is divided into three categories: deficit, adequate and excessive. Meanwhile, work fatigue is classified into 4 categories: normal or no fatigue, mild fatigue, moderate fatigue and severe fatigue. To analyze two variables that are assumed to be related to each other, we use bivariate analysis and chi-square test is used for the statistical test. If the p-value less than 0.05, H^0 is rejected, means there is a relationship between the dependent and independent variables. If the p-value greater than 0.05, H^0 fails to be rejected, means there is no relationship between the two variables. This research has received ethical approval from the Health Research Ethics Committee Faculty of Public Health Universitas Airlangga No: 184/EA/KEPK/2022.

RESULTS AND DISCUSSION

The survey was conducted in Karanganyar village in October 2022 and the population of this survey were all female potters in Karanganyar village with a total of 70 workers. The sample drawn for the survey consisted of 43 respondents. Table 1 shows the distribution based on characteristics such as subject age, nutritional status, diet, calorie intake, and work fatigue. This illustrate that most of the respondents in this survey were between the ages of 41 and 50 (32,6%), more than half of the respondents are in normal nutritional status, majority have good diet, but most of them had deficit in calorie adequacy and almost all of them experience work fatigue.

Table 1 shows that the majority of respondents are in the age range of 41-50 years as many as 14 people (32.6%) of all respondents, followed by the second most in the elderly or >61 years as many as 11 people (25.6%), age range 51-60 years as many as 9 people (20.9%), 31-40 years as many as 7 people (16.3%) and the least is age 21-30 years as many as 2 people (4.7%). Most of the workers are women aged 40 years and above and some are even 70 years old, which is no longer a working age group.

Age is also one of the factors that influence work fatigue. The increasing age of a person will reduce physical abilities and muscle elasticity and strength. Physical abilities such as vision, hearing, reaction will decrease as people age[15]. A survey of pedicab drivers in North Kotamobagu District, North Sulawesi, Indonesia, found that the driver of the pedicab that aged less than 34 years old, there are 25 drivers who experienced fatigue, with 18 drivers experience moderate fatigue and 7 drivers categorized in severe fatigue, while 13 drivers pedicab who aged more than 34 years all of them experienced work fatigue with category extreme fatigue [16].

Table 1. Frequency Distribution of Individual Characteristics of Female Pottery Crafters in Karanganyar Village, Borobudur, Magelang

Characteristic	n	%
Age		
21 – 30 years old	2	4.7
31 – 40 years old	7	16.3
41 – 50 years old	14	32.6
51 – 60 years old	9	20.9
61 – 70 years old	11	25.6
Nutritional Status		
Underweight	2	4.65
Normal Weight	22	51.16
Overweight	19	44.18
Diet		
Poor	28	65.12
Good	15	34.88
Calorie Adequacy		
Deficit	30	69.77

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Characteristic	n	%
Adequate	10	23.25
Excessive	3	6.98
Work Fatigue		
Normal	5	11.63
Mild	21	48.84
Moderate	15	34.88
Severe	2	4.65

The nutritional status of workers is determined by the Body Mass Index (BMI) indicator. Based on the nutritional status category group, it was found that normal nutritional status dominated among female pottery workers in Karanganyar Village. It is known that 22 people (51.16%) of respondents have normal BMI, 19 people (44.18%) have overweight nutritional status and 2 people (4.65%) of them are underweight. Empowering women tend to be more informed and in control of their income and wealth Resources improve agency in making decisions about efficient use of time, food intake, hygiene, and more healthy habits[17]. Because women in Karanganyar village work and have their own sources of income, they tend to have control and access over what they consume, so the average nutritional status is good. More than half of the respondents have a normal BMI, and the rest are overweight and only a few are underweight.

Meanwhile, in the workers' diet, 28 people (65.12%) of respondents had a good diet and the remaining 15 people (34.88%) had a poor diet. Dietary research is based on workers' consumption patterns of food form ingredients that have been adjusted to the availability of foods at the research location. There are 50 types of foodstuffs available and are grouped into foodstuffs containing carbohydrates, plant-based protein, animal protein, vitamins, and fats, as well as consumption of beverages commonly consumed by the community. The results obtained from the test are that 95.9% of workers consume carbohydrates from rice which is consumed more than once a day, the rest of the diverse results are obtained from other types of carbohydrates such as noodles, potatoes, sweet potatoes, bread, corn, and cereals. Meanwhile, the fulfilment of daily protein consumption is mostly obtained from plant-based protein sources, namely tofu and tempeh at 81.6%, other sources come from nuts and only a few workers routinely consume animal protein such as chicken, fish, meat, eggs and so on because the standard of living of the people in Karanganyar Village is a lower economic community so that access to animal protein is difficult. Meanwhile, the fulfilment of fruit and vegetable consumption is almost every day with various types of food, so that workers' daily vitamin needs are sufficiently met. The consumption of sweetened beverages is dominated by the consumption of tea, the majority as much as 30.6% consume tea once a day. The diet of pottery workers does not consume many snacks, workers tend to only consume staple foods to fulfil their daily needs. In general, the consumption patterns of crafters are quite good, only some crafters are not sufficient in varying the types of food they consume due to limited access and old age that cannot digest some types of food that are difficult to consume so that their diet scores become poor. A balanced diet is consuming a diet consisting of a variety of foods according to the daily calorie needs required. Balance in consuming food can determine a person's health[18].

Looking at the calculation results for the level of energy adequacy using the food recall questionnaire, the calorie adequacy rate of female pottery workers is 30 people (69.77%) respondents experiencing deficit / lack of calorie adequacy, 10 people (23.25%) of whom have adequate calorie adequacy rates and 3 people (6.98%) others experience excess daily calorie adequacy. Calories are a unit of energy in food and drink, as well as the energy needed for activity. Each person's calorie needs can vary depending on gender, age, weight, height, and daily physical activity. Calories found in food and beverages consumed are the source of energy for activity. If the daily calorie intake is less than what is needed, the body will lack energy and become weak. Long-term calorie deficiency risks malnutrition (nutrient deficiency), weight loss, decreased immunity and illness, and impaired quality of life. It was found that 30 out of 43 workers experienced a calorie deficit which means their calorie needs were not met, the lowest consumption was only 579 kcal while the highest consumption was 1852 kcal which when averaged was only 1120 kcal. The comparative score of workers' daily calorie consumption at the time of the study was lowest at 51% and highest at 129%. This indicates that workers are very poor at fulfilling their daily calorie intake.

From measurements using a reaction timer, it was found that almost all crafters experienced fatigue after work, only 5 people were categorized as normal or not tired at all. The most common work fatigue experienced by workers is the mild fatigue category, namely 21 workers (48.84%), followed by moderate fatigue experienced by 15 workers (34.88%), 2 workers (4.65%) experienced severe fatigue while 5 workers (11.63%) did not experience fatigue / normal conditions.

Table 2. Relationship Between Diet, Nutritional Status, and Calorie Adequacy with Work Fatigue in Female Pottery Crafters in Karanganyar Village, Borobudur, Magelang

Variables	Level of Fatigue								Total	%	p-value
	Normal	%	Mild	%	Moderate	%	Severe	%			
Nutritional Status											
Underweight	0	0	0	0	2	100	0	0	2	100	
	1	4.54	14	63.63	5	22.72	2	9.09	22	100	0.098

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Variables	Level of Fatigue								Total	%	p-value
	Normal	%	Mild	%	Moderate	%	Severe	%			
Normal Weight	4	21.05	7	36.84	8	42.10	0	0	19	100	
Overweight											
Diet											
Poor	1	6.66	3	20	10	66.66	1	6.66	15	100	0.010
Good	4	14.28	18	64.28	5	17.85	1	3.57	28	100	
Calorie Adequacy											
Deficit	1	3.33	15	50	12	40	2	6.66	30	100	
Adequate	4	40	5	50	1	10	0	0	10	100	0.044
Excessive	0	0	1	33.33	2	66.66	0	0	3	100	

Relationship between nutritional status with work fatigue (p>0.05).

In workers with underweight nutritional status, only 2 people experienced moderate physical work fatigue. Meanwhile, workers with normal BMI only 1 person did not experience fatigue, the majority of workers experienced mild fatigue, namely 14 people, 5 of whom experienced moderate fatigue and 2 others experienced severe fatigue. Workers who have a nutritional status classified as overweight, as many as 4 people did not experience fatigue, 7 others experienced mild fatigue, 8 people in the moderate category and no one experienced severe fatigue.

Based on the p-value=0.098, it shows that there is no relationship between nutritional status and work fatigue. This can be influenced by the nutritional status of respondents on average in a normal state, namely 51.16%. In line with research on the Relationship between Length of Work and Nutritional Status with Work Fatigue in Gold Craftsmen in Wajo Makassar with p-value=0.311 with 70% craftsmen's BMI in normal score[19]. Another study conducted by PT Sari Usaha Mandiri Bitung showed that there was no significant relationship between nutritional status and work fatigue (p-value=0.069) [20]. Research conducted on workers of PT. X Batang also showed that there was no relationship between nutritional status with work fatigue with a p-value=0.129[21]. The research conducted in the sewing department at CV Aneka Garment Gunungpati and at PT Antam Tbk. UBPP Logam Mulia also found that there was no relationship between nutritional status and work fatigue (p-value=0.191 and p-value=0.224)[15,22]. The absence of a relationship between nutritional status and work fatigue in female pottery craftsmen in Karanganyar Village is partly due to the results of testing the majority of craftsmen have normal nutritional status.

Relationship between diet with work fatigue (p<0.05).

Diet will affect the performance of workers, if workers have a good diet, then workers will provide maximum performance and are not easy to feel tired quickly at work. Vice versa, a poor diet will result in a decrease in the quality of work from workers and workers will quickly feel tired. This correlation can be seen from the results of this study, namely 28 workers who had a good diet, 4 of whom did not experience fatigue, 18 experienced mild fatigue, 5 moderate fatigue and 1 person experienced severe fatigue. Meanwhile, 15 workers who had a poor diet, only 1 person did not experience fatigue, the remaining 3 people experienced mild fatigue, 10 people experienced moderate fatigue and 1 experienced severe fatigue.

The results showed a p-value=0.010, which means there is a significant relationship between the diet of crafters and the incidence of fatigue experienced. In general, most crafters have a good diet, namely 28 people, where the average score of consumption of various types of food such as carbohydrate groups, protein, fat, and vitamins consumed by workers compared to all respondents is good. The other 15 people had a poor diet score due to lack of access to varied food types. It was found that some workers only consumed 1 type of food in 1 day and only consisted of 1 or 2 types of food groups.

In the study of industrial workers in the Aluminum Metal Smelting Household Industry Raya Indramayu in 2018 which shows there is relationship between variety nutrient intake and fatigue. Nutrition food in workers has a very important role both for welfare, as well as to improve discipline and productivity[23]. Lack of nutritional value in the food consumed by workers daily will bring adverse effects on the body such as the body's defense against disease decreases, lack of physical ability, weight decreased, pale face lack of enthusiasm, lack of motivation, slow reaction and so on[24]. Another research on the irregular dietary pattern of weavers in Gelgel Village. Weavers do not routinely consume food per day. Therefore, the consumption of calorie intake of weavers is not in accordance with calories that should be required by body to do the work, Irregular consumption patterns irregular diet patterns can increase weaver fatigue by 49.5% between before and after work[25]. The study that investigated the beneficiary influence of certain meal compositions on the performance of workers. They showed that the ratio of protein and carbohydrates should be 1/3 to provide an optimal diet for workers[26]. When protein and energy intake does not meet an individual's needs, the body's stores are depleted to provide energy, resulting in the breakdown of body fat and muscle mass, leading to symptoms such as exhaustion and exhaustion. Poor nutrition reduces physical performance and leads to fatigue. However, most of the evidence for an association between dietary components and fatigue comes from chronic fatigue syndrome (CFS). Some nutritional deficiencies (vitamin C, vitamin B, sodium, magnesium, zinc, folic acid, L-carnitine, L-tryptophan, essential fatty acids, coenzyme Q10) have been reported in his CFS patients[27]. Another study also found that adherence to healthy dietary

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patterns may reduce systemic inflammation, severity of fatigue, MS attacks, improved quality of life and balance weight especially body fat in MS patients[28].

Relationship between calorie adequacy with work fatigue (p<0.05).

Humans need energy for activity and work, the fulfillment of energy can be obtained from the food consumed. Food consumed can be categorized into various types including carbohydrates, proteins, fats, vitamins and so on. There are a certain number of calories that must be consumed so that the daily energy adequacy of workers can be met. If the fulfillment of daily energy is sufficient, it will result in work productivity, but if food consumption is insufficient to meet daily needs, it will result in various risks such as dehydration, fatigue, loss of focus, illness and so on. In this study, it was found that the adequacy of calories received by workers had a relationship with the incidence of fatigue experienced by workers. Most workers had poor daily calorie adequacy, namely 30 people, so only 1 did not experience fatigue, while 15 people experienced mild fatigue, 12 people experienced moderate fatigue and 2 people experienced severe fatigue. As for those with good energy adequacy, 10 people, 4 people did not experience fatigue, 5 people experienced mild fatigue, 1 person experienced moderate fatigue, and no one experienced severe fatigue. Calorie fulfillment can also be excessive or exceed the normal calorie fulfillment standards in general, this also has an impact on the human body. Excess calories received by the body will be stored by the body in fat reserves. Excess consumption of certain types of food can also result in fatigue. In this study, there were 3 workers who had excessive daily calorie consumption, 1 person experienced mild fatigue while the other 2 experienced moderate fatigue.

These results are in line with the Research on the Adequacy of Energy Intake According to the Level of Work Fatigue of Production Workers of PT Multi Aneka Pangan Nusantara Surabaya in 2017, which explained that the lower the energy intake of workers, the higher the work fatigue felt by respondents[29]. Energy depletion can affect muscular tissue's ability to store glycogen and get oxygen, which makes it harder for muscles to contract and perform tasks. Because of the constriction of muscular blood vessels brought on by the internal pressure of the muscle tissue, statically active muscles will struggle to maintain blood flow, forcing them to rely mostly on dietary stores and anaerobic processes for energy production. The synthesis of ATP, one of the byproducts of the anaerobic process, can result in the buildup of the metabolite lactic acid in muscle tissue. Muscle fatigue is caused by the accumulation of lactic acid in muscle tissue.[30]. Data from another study on Work Fatigue based on Workload and Calories Intake in Several Food Makers found that 66.7% of workers' energy intake was still considered insufficient (<70% of the Energy Adequacy Rate). It was found that there is a significant correlation between calorie intake and work fatigue with value p-0.0000[31]. The lower the calorie intake, the more severe work fatigue experienced by the workers. The claim is in accordance with the statement of study of Faktor Yang Berhubungan Dengan Kelelahan Kerja Pada Tenaga Kerja Engineering Bagian Maintenance Mekanik (Studi Di Pt Sinar Mas Agro Resources And Technology (Smart) Tbk Surabaya) which believes that if the calorie intake in the body is less or more than the normal amount, a person will more easily experience work fatigue[32]. Adding food consumption which contain high calorie during work such as snacks can prevent workers from getting tired easily. A qualitative study of 12 registered nurses found that some nurses consumed high-sugar foods and sugary drinks to prevent or manage fatigue[33]. In study of Shift work relationships with same- and subsequent-day empty calorie food and beverage consumption observed that 79.5% of participants' sugary drinks contained caffeine (e.g, cola, tea). The increased likelihood of consuming sweetened beverages in this study may be related to participants' coping strategies for night shift fatigue[34].

CONCLUSIONS

After all data were analyzed, conclusions were drawn. From these results, it was found that the variables of nutrition and calorie adequacy are closely related to the occurrence of work fatigue in female pottery crafters of Karanganyar Village. However, the variable of nutritional status was not significantly related to the incidence of work fatigue in female pottery crafters of Karanganyar Village.

The dual role carried out by female pottery craftsmen, namely as workers and as housewives, limits the time for craftsmen to eat and meet their daily calorie needs. It is recommended that the local government through village-owned enterprises in Karanganyar Village provide work breaks to craftsmen and provide healthy and vary snacks that can be consumed by pottery craftsmen while working which can increase workers' daily calorie intake and prevent workers from work fatigue.

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