Conference Paper

The Influence of Caloric Intake to Work Fatigue of Nurses in Inpatient Care Unit RSU Haji Surabaya, 2015

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Abstract

Nurses in inpatient care unit had high work demands. The high work demands could increase work activities. Work activities could be done when our body has energy. The energy generates from daily calorie intake. When nurses had less calorie intake, it affects their health in several ways, such as work fatigue. Fatigue includes a condition with lower activities, motivation and physical fatigue. The purpose of this research was to analyze the influence of calorie intake on the work fatigue of nurses in inpatient care unit. This study was an observational descriptive study that applied cross-sectional design. The population was 27 nurses at IIIC and IVC room. Data were analyzed by using Ordinal Regression test. The results showed that 44 percent of respondents had sufficient levels of calorie as less than 90 percent which was proved that the majority of respondent classified in less calorie intake category. There were different levels of work fatigue for each respondent. The parameter estimates that the less calorie intake potentially cause work fatigue than the more calorie intake. Based on the findings, the result of variables indicated that there is an influence of calorie intake on fatigue and it could be concluded that the calorie intake is influential to work fatigue by 25.20 percent.

Keywords: nurse, work fatigue, physical workload, work shift, caloric intake

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1. Introduction

The work nutrition is needed to supply the energy according to the type of work [1]. Work nutrition aims to preserve and maintains health, and as an effort to increase the productivity of workers. The nutritional situation is not only associated with health, but also related to the development and growth, ability to grow and work, and productivity [2]. Certain conditions of work, for example, the worker who works on the night shift,

poor workplace environment, high work demands, and other, need different nutrition depending on the type of work. One of the jobs that have high work demand is a nurse.

Nurses are one of the resources who have an important role in healthcare at the hospital. Nurses have high work demands, especially nurses who served in Inpatient Care Unit. Because nurses in Inpatient Care Unit have to work 24 hours for 7 days. The high demands of work can increase the activity of nurses. The energy that used to work obtained from food consumed each day, like breakfast, lunch, dinner, and snack. According to Minister of Manpower and Transmigration that worker must get energy from food consumption for breakfast, lunch, dinner, and extra food (if doing night shift). Caloric intake has the role of the fulfillment of energy that used for work [1]. The higher the work activities, the higher the energy required, so that the caloric intake should also be higher.

If the energy and nutrient are reduced and it lasts longer, it will be decreased of worker's weight [3]. More caloric intake can cause obesity and less caloric intake can make thin [4]. Either excess or lack of caloric intake affects the efficiency and productivity of work.

Work fatigue is one of the health problems that can be caused by excess or lack caloric intake [5]. Work fatigue is the condition of the weakening of activity, motivation, and physical exhaustion to do work. Fatigue is the decrease of body's endurance and power to work [1]. work fatigue not only experienced by workers who work in the industry but also in health care, such as nurses. This is evidenced by the study that said the majority of nurses in dr. Mohammad Soewandhie Surabaya gets work fatigue [6]. A similar study showed that most of the nurses in Mawar Kuning Inpatient Care Unit of RSUD Sidoarjo get work fatigue [7]. In addition, research indicates that the nurses in Inpatient Care get different levels of work fatigue [8, 9]

RSU Haji Surabaya is a provincial referral hospital. Based on preliminary studies, BOR achievements in 2007 until 2014 at IIIC and IVC tends to increase and reached 78.28 percent and 74.32 percent. Marwah room is the highest achievement of BOR. BOR performance enhancement that shows an increasing use of services of Inpatient Care Unit at RSU Haji Surabaya. This shows that work activities of nurses also get the increase. Based on Inpatient Unit Management Accountability Reports at 2011 showed that 78.57 percent of respondent get physically burdened and as much as 81 percent of respondent get the high level of subjective workload. The high of physical workload shows that the nurses have high activities so that the used energy by nurses is also getting bigger and required greater of caloric intake.

If work fatigue is not resolved, it will be an accumulation of fatigue, so it can more severe impact on health. The risk of work fatigue is decreased work motivation, low performance, low quality of work, many errors, low productivity, occupational stress, occupational diseases, injuries, and work accidents [5]. Meanwhile, the impact of work fatigue is decreased work performance, illness, decrease morale, and low productivity. [5].

The purpose of this research is to analyze the influence of calorie intake to work fatigue of nurses in inpatient care unit in IIIC and IVC room at RSU Haji Surabaya. Intake caloric mean is the intake caloric from food consumption each day. Work fatigue is the fatigue because of the work.

2. Methods

This study was an observational descriptive study that applied the cross-sectional design. The population was the nurses at IIIC and IVC. The respondent was total population of 27 nurses at IIIC and IVC with following criteria. The following criteria were no history of the disease, suffering and do not have the risk of anemia, not smoking, female respondent was not menstruating, not pregnant, and not breastfeeding, healthy, and willing to participate in this research. Data collected through individual characteristics by questionnaire, a questionnaire of Industrial Fatigue Research Committee (IRFC) for measure the fatigue, food record form (use estimated food records) for 2 days and synchronized with calorie needs. Data analyzed by using Ordinal Regression test to recognize the influence of caloric intake to work fatigue. The result of data presented by frequency tables and cross-tabulations.

3. Results

3.1. Characteristic of respondent

Characteristic of respondent include age, gender, the timing of work, marital status, and nutritional status. It was identified several characteristics of the respondent. Most of the respondent aged between 30–49 years old, female, had been working for more 5 years, married, and normal nutrition status and the average calorie intake of nurses is 2407 Kcal (Table 1).

Table 1: Characteristic of respondent.

Characteristic of Respondent	Number of Respondent	Percentage (%)
Age		
19–29	13	48.15
30–49	14	51.85
50–64	0	0
Gender		
Male	5	18.52
Female	22	81.48
Timing of Work		
≤ 5 years	12	44.44
> 5 years	15	55.56
Marital Status		
Married	21	77.78
Not Married	6	22.22
Nutritional Status		
Severe thinnese (< 17)	0	0
Mild thinnese (17 s.d. 18.4)	3	11.11
Normal (18.5 s.d 25)	17	62.96
Overweight (25.1 s.d 27)	3	11.11
Obese (> 27)	4	14.81

3.2. Caloric intake of respondent

Most of the respondent had sufficient levels of caloric intake as less than 90 percent which was proved that the majority of respondent classified in less caloric intake category (Table 2).

Table 2: Caloric intake of respondent.

Caloric Intake of Respondent	Number of Respondent	Percentage (%)
Less (< 90)	12	44.4
Normal (90–110)	10	37.0
More (> 110)	5	18.5

3.3. Work fatigue of respondent

There were different levels of work fatigue for each respondent. Most of the respondent had the moderate level of work fatigue (Table 3).

Table 3: Work fatigue of respondent.

Work Fatigue of Respondent	Number of Respondent	Percentage (%)
Low	10	37.0
Moderate	14	51.9
High	3	11.1
Very high	14	51.85

3.4. Distribution of work fatigue based on caloric intake

It showed that respondent who had less level of caloric intake had low level of work fatigue (Table 4).

Table 4: Distribution of work fatigue based on caloric intake

Work Fatigue	Low	Moderate	High	Total
Caloric Intake				
Less	7 (25.9%)	5 (18.5%)	0 (0.0%)	12 (44.4%)
Normal	3 (11.1%)	5 (18.5%)	2 (7.4%)	10 (37.0%)
More	0 (0.0%)	4 (14.8%)	1 (3.7%)	5 (18.5%)
Total	10 (37.0%)	14 (51.9%)	3 (11.1%)	27 (100%)

3.5. Output of ordinal regression test

The parameter estimated that difference intake the less caloric and over calorie more likely potentially cause work fatigue than difference compared to intake enough and over calories. Ordinal Regression test shows the result of variables indicated that there was the influence of caloric intake to work fatigue (as indicated by determination coefficient 0.252) and it could be concluded that the caloric intake influential to work fatigue by 25.20 percent (Table 5).

Table 5: Distribution of work fatigue based on caloric intake.

Variable	Estimate	Details
Work Fatigue (1)	−2,218	Low and high of work fatigue
Work Fatigue (2)	0,952	Moderate and high of work fatigue
Caloric Intake (1)	−2,603	Low and over of caloric intake
Caloric Intake (2)	−1,020	Normal and over of caloric intake
Caloric Intake (3)	0	–

4. Discussion

One of the causes of work fatigue is caloric intake [5]. The caloric intake will become energy to be used to perform the activity. Caloric consumption has a role as an energy source, the heavier work is needed the more energy [1]. Based on the result, it is indicated that there is the influence of caloric intake to work fatigue (as indicated by determination coefficient 0.252) and it can be concluded that the caloric intake influential to work fatigue by 25.20 percent.

Nurses who have a low level of work fatigue with less caloric intake due to less caloric intake, so that the body is the deficiency of glucose. The fulfillment of glucose available for glycogen metabolism. One of the results of glycogen metabolism is lactic acid. If the body has less caloric intake for long-term, the glycogen will be metabolized continuously. This condition can lead to increased production of lactic acid. The accumulates of lactic acid and water in the muscle can make swelling and difficult to contraction, then cause symptoms of work fatigue [11] This is same with research said that most of the workers in the Nutrition Installation at Rumah Sakit Bhayangkara Pusdik Gasum Porong have low level of work fatigue because of their caloric intake has not been fulfilled [12].

Based on the nursing rules at RSU Haji Surabaya that eating while working is an offense. Meanwhile, a snack after doing the work for 2 hours can replace the energy that has been used to work [1]. In addition, fatigue can be recovered after having enough energy [5]. One of effort to prevent more severe work fatigue the snack to nurses. A snack is dependent on workplace environment and it will be the snack, easily digestible, fulfillment the caloric needs, and nutritious, such as tea, green bean porridge, fruits, and cold drinks [1]. Furthermore, the hospital should have a food catering. The food catering expected to meet caloric intake, because the hospital rule said that the nurses were not allowed to leave the room at the time of service. Besides that, the room of nurses away from the hospital cafeteria. There are causes the nurses could not

buy food in the hospital cafeteria so that the nurses cannot fulfill their caloric intake from lunch. One of the reasons their respondent did not have the option to buy food because of the physical aspect of workplace [13]. It's mean that distance of cafeteria determines of intake calorie, as well as nurses at RSU Haji Surabaya.

Nurses who have a low level of work fatigue with more caloric intake due to Body Mass Index (BMI) which in obese level. A person who has overweight will be more tired and easy to make mistakes in their work [14]. Overweight can trigger of fat accumulation in the body, including the organs of the body, thereby it can increase the workload of these organs. The blood vessels are one of room to fat accumulation. The accumulation of fat in the blood vessel can block blood flow [2]. The obstructed of blood flow can make reduced of oxygen supply, so the anaerobic process of glycogen metabolism on muscle changed into energy and lactic acid. The pile of lactic acid potentially cause work fatigue. This study as same as with research that high level of work fatigue occurs in the overweight level of caloric intake groups [7].

Based on the interview that there are no sports activities for nurses. The morning gymnastics only for hospital employees. The hospital should consider establishing morning gymnastic for nurses. Do gymnastic is expected to improve the health status of nurses, improving physical fitness, as well as management to reduce the nurse's overweight. The healthy body and fresh and supported by enough energy are sufficient capital to do optimally work [15].

The results also showed that the less and more level of intake caloric is more likely to cause fatigue. Less and more level of caloric intake affects productivity [5]. More level of caloric intake can lead to overweight or obese and less level of caloric intake causes underweight and thin. This is supported that undernutrition or more potentially cause illness and reduced work ability [1]. Some study said that there are different levels of work fatigue at respondents with less, normal, and more level of caloric intake [16]. There is correlation between caloric intake and work fatigue that shows getting less or more calories can increase level of work fatigue [17].

If this condition continuously occurs, work fatigue will be accumulated, and it can reduce the health status of nurses. So that, the hospital needs to make the policy about work fatigue management. One of the efforts to preventing, coping, and treating work fatigue is applied the work fatigue management [10]. Work fatigue can be overcome by doing the preventive, curative, and rehabilitative program. Besides that, the implementation and management of work nutrition also need to be considered, because nutrition is very important for nurses to support their work.

5. Conclucions

According to results and discussion, it can be concluded that there is the influence of caloric intake to work fatigue of 25.20 percent. It means that 25.20 percent causes of work fatigue are caloric intake and 74.80 percent by other causes. In the next study, we or other researchers can do better and more detail study by using a better method, the example using lactic meters to know levels of lactic acid in the blood or other specific tests.

Competing Interest

Authors declare that they have no significant competing financial, professional, or personal interest that might have influenced the performance or presentation of work described in this article.

Ethical Approval

This research has a certificate of ethical clearance with number 073/11/KOM.ETIK/2015.

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