



The Determinant Factor of Urinary Stone Formation on Palm Oil Processing Workers at PTPN VII Betung

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Abstract

High temperature of work environment affects fluid and electrolyte balance of workers. It is also affecting the urine production by increasing its concentration and if it lasts for a long time causes urinary crystallization. This work was aimed to analyze the determinant factor of urinary stone formation within palm processing workers at PTPN VII Betung. Population sample in this work is 103 workers which represents total population of workers at PTPN VII of Betung unit. Research was designed quantitatively using cross-sectional study. Data collection was carried out using several instruments i.e. questioner, interview and observation. The obtained data was processed through univariate, bivariate and multivariate analysis. Result shows the number of workers with a positive urinary crystallization are 18 workers (17.5%). Characteristic of respondent are typically aged < 45 years (68%), hydration status was not dehydrated (53.2%). Multiple logistic regression analysis result shows hydration status variable (OR = 5.508) affects the formation of urinary stone with worker's age as confounder.

Keywords : Urinary crystallization, hydration status, worker's age, PTPN VII Betung unit

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1. Introduction

Work productivity is influenced explicitly by environment comfort factor such as temperature. On contrary, uncomfortable condition creates disturbance or even psychological effect and physiological pain. Human body contains a lot of water known as body fluid which comprises mineral electrolytes such as sodium, potassium, calcium and chloride [1]. Fluid balance within body is achieved when water intake is in equilibrium with water being excreted. Water was excreted through urination, faces, respiration and perspiration. Water discharged via respiration and perspiration also known as insensible loss [2].

Loss of fluid and electrolytes via perspiration in large amount must be accompanied by proportional amount of drinking water intake. Unbalanced condition between these two occasions will reduce blood pressure and increase pulse. Excessive fluid loss influence urine production and enhance its saturation (hyper saturation/supersaturation). Such condition if happens in long duration tends to increase the risk of crystal and stone

formation within urinary tract [1];[3].

Decrease in body fluid without proper amount of intake will turn body into dehydration [4]. Dehydration decrease urine production but increase its saturation and creates kidney problem risk [5]. Balance-nutrition guidance requires that body fluids must be complied through food and beverage consumption. Water intake needed by human body mostly is fulfilled through drinking water minimum 2 liters/day or approximately 8 glasses of water (size 250 mL). In certain condition such as workers at high temperature environment, water intake needed is larger with minimum amount 6 liters/day [6].

Heat produces during palm oil processing might be spread to whole work environment which cause increase of temperature. Human body response against such temperature would be excreting water which has to be compensate by proper amount of water intake otherwise workers would be dehydrated. Dehydration results a decrease in urine production along with increase its saturation which in turn disturbed kidney if it happens repeatedly [5]; [1].

Muis, [7] suggested high percentage of respondent

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