

Evaluate Impact of Water Metabolism on Metalwork Craftsmen for Effective Job Performance and Productivity

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ABSTRACT

This paper presents evidence on the impact of water metabolism on metalwork craftsmen for effective job performance and productivity. This study was conducted on 60 electric arc welders, 40 panel beaters, 10 black smiths and 10 foundry workmen in Akoko land. In 120 individuals investigated were exposed to thermal stresses that need adequate water consumption for effective job performance and productivity. The inclusion criterion for this study was working in an environment that included a heating process. The study adopted a survey research design. The study used structured questionnaire as an Instrument for data collection to elicit the opinions from the respondents. The instrument was validated. The responses to the items were based on a four-point scale, with numerical value of 4, 3, 2 and 1. Descriptive statistics was used to analyze the data collected from the study for answering the research question. The study was carried out in Akoko South-West and Akoko South-East Local Government Area of Ondo State. The population of this study comprised all 120 metalwork craftsmen. There was no sample all enter population of 120 was used. The findings of the study showed that the respondents agreed that water metabolism help in effective job performance and productivity. Based on findings and discussion, conclusions were drawn and recommendations made, among was that one should not wait until is thirsty to drink water.

KEYWORDS: Water, Dehydration, Craftsmen, Job Performance

INTRODUCTION

Heat is recognized as a harmful physical factor in many workplaces that could lead to fatigue and disease in the human body that influences workers job performance and productivity. Habibollah, Vajihah and Peymaneh (2016) opined that heat is a known hazard for personnel who work in industries with melting processes. Working in a safe physical condition increases workers performance and productivity. A hot environment is unhealthy its psychological effects on workers does not only emphasize on workers' health but pays attention to the individuals activity to produce high quality and quantity products and facilitate workers' job performance. When people perform physical activities in hot environments, they are at risk of increase in deep* body temperature. This could lead to decrease in physical work capacity and mental capacity, increase in accident frequency, and ultimately, heat exhaustion and heat stroke (Beheshti, Boroumand, Bahalgerdy, Mehrafshan and Zamani, 2016). Hot work place can influence the health of workers labour productivity and complications, extreme heat in workers can some cases lead to death. The effects of this are increased deep body temperature along with dehydration resulting from inadequate water consumption. Dehydration is the adverse consequence of inadequate water intake (Grandjean, A, 2004). Excessive dehydration may result in irritability, nervousness, moodiness, depression, cardiovascular complications, perspiration, water and electrolyte imbalance, and changes in blood flow rate that could actually reduced labour skills, increases muscular fatigue, poor concentration, Hubler, Klepper & Peterson, (2008) and thus, increased frequency of mistakes that could lead to poor job performance.

Collectively, research has shown progressive decrements in work performance with increasing levels of dehydration. According to Wasterlund (2001) who carried out a study on the effects of heat stress on the health and productivity of

forest workers using manual working methods in temperate conditions in North East Zimbabwe. The forest workers were given either 0.17 or 0.6 liters of water each half hour. Based on the findings of dehydration and reduced productivity, the researcher concluded that International Labour Organization recommendations for the consumption of at least 5 liters of fluid per day during heavy forestry work should be extended to work under temperate conditions. This can be associated with metalwork craftsmen who strenuous activity result to dehydration that can impaired job performance and productivity, that need water for sustainability and good health. A craftsman is an artisan who practices a trade and during which water passes through the skin and is then lost by evaporation, and water that is lost from the respiratory tract.

Metalwork craftsmen produce metals products for the benefits of mankind. Metal forming contributes to the well being of individual, because household items, agricultural implements' and vehicles parts are made. Metalwork is activity based, according to Sackey and Amoakobeme (2013) it involves bending, cutting, casting and joining of such materials as tinplate and galvanized mild steel under hot environment. According to Thompson, Boddy, Stein, Whear, Barton, & Depledge, (2011) workers of hot industries like metal and glass melting are in different conditions to measure heat stress. In such industries, Badayai (2012) opined that the environmental temperature is high so that the body cannot transfer to its environment and in result, some physiological problems are provided by the heat. He further, studies have shown that occupational diseases, productivity decrease and safety problems are higher in people who work in hot environments. During these intense physical activities, voluntary dehydration do happened due to inadequate water consumption. Dehydration occurs when the amount of fluid leaving the body is greater than the

amount going back into the body. Inadequate intake of water during strenuous activities that involved hot temperature/environment could hinder metalwork craftsmen job performances that could lead to unhealthy condition.

Often times, metalwork craftsmen required to work under hot environments for a period of hours. When the temperature is high, the body will be unable to maintain a normal temperature, this could result into heat illnesses that can result to death. According to Occupational Safety and Health Administration (OSHA)(2016) most serious heat-related health problem is heat stroke. Heat stroke occurs when the body's temperature regulating system fails. Preventing sudden death, water become imperative for human survival for both drinking and other usage. Lozán et al (2007) asserted that death of animals occurs even more rapidly if they do not take in the minimum quantity of water in a certain period. This can also be applicable to human. Physically, water serves as the transportation medium for nutrient salts and other vital materials such as enzymes and hormones to their target organs. It serves as the solvent for most metabolic reactions and for renal elimination of endogenous waste- and other toxic materials. These reactions include such as those responsible for getting energy from food, processing and removal of waste, growth, building up muscles, cell division, and reproduction.

Indeed, many see drinking water as the most important individual factor in controlling disease and healthy improving living conditions. Crohn's and Colitis (2018) opines that our bodies are made up of about two-thirds water we only need the total water level to drop by as little as a few percent for us to become dehydrated – that is, lacking in water. This can eventually lead to problems, such as kidney stones, damage to the liver, muscles and joints, and seizures. Dehydration happens when we lose more fluid than we take in. We lose body fluid and salt throughout the day in sweat, tears, moisture in the breath, urine and stools (faeces). Usually, the water and salt content of what we eat and drink make up for this loss – but we become dehydrated if fluid loss exceeds fluid intake.

Water helps living organisms to maintain the physical equilibrium, to regulate its internal and external environment of humans for stable healthy life. Water is necessary for human survival and live in a healthy life condition. The relationship between water, humanity and natural system is discussed by psalmist in the Bible book, which acknowledges the important of water to living organism's growth and their development. He described the condition of trees planted by the streams of water, that it produces fruits in its season, and does not wither (Psalm 1:3). Water is an essential nutrient for all known forms of life and the mechanisms by which fluid and electrolyte homeostasis is maintained in humans (Grandjean, 2004).

Water is a unique need of humans' that more than physical, spiritual and social needs. It is used in a variety of purpose such as washing, drinking and agricultural needs. Cooperative Extension Service (2007) opines that water is ranked second only to oxygen as essentials for life, with more than half of our body weight made of water. Losan, Meyer and Karbe (2007) asserted that without water no life and technical plants from different cultures give evidence for

the indispensability of water. Water cannot be interchanged with any other substance. UNESCO (2012) opines that water is essential for life and livelihoods, is core of infrastructural. Inadequate water drinking during strenuous activity can result in dehydration and impaired metalwork craftsmen job performance. Therefore, the aim of this study was to investigate the impact of water metabolism on metalwork craftsmen on job performance and productivity.

Statement of the problem

As the contributions of metal product in the society to the human comfort is at increase, to stay healthy for metalwork craftsmen become pertinent. Heat is one of the harmful effects on human in many workplaces. Working in a hot environments increases body temperature that could lead to low job performance and low functionality of the craftsmen. Therefore, the aim of this study was to evaluate impact of water metabolism on metalwork craftsmen on their job performance and productivity.

Purpose of the Study

The main purpose of this study was to:

1. Evaluate the role of water metabolism on health of metalwork craftsmen for job performance and productivity.
2. Evaluate effects of inadequate water metabolism on metalwork craftsmen on job performance and productivity.

Research Question

Two research questions were formulated to guide the study:

3. What is the role of water metabolism on health of metalwork craftsmen for job performance and productivity?
4. What are the effects of inadequate water metabolism on metalwork craftsmen on job performance and productivity?

Methodology

The study adopted a survey research design. Sofoluwe (2013) defined a survey research design as the one that describes parameters for statistics obtained from unbiased samples involving the use of questionnaire to obtain information from a sample of the respondents. Thus, a survey research design is considered suitable for this study, as it will elicit the opinions from the respondents using structured questionnaire. The study was carried out in Akoko South-West and Akoko South-East Local Government Area of Ondo State. The population of this study comprised all 120 metalwork craftsmen. There was no sample all enter population of 120 was used. The Instrument for data collection in this study was a structured questionnaire. The instrument was validated. The responses to the items were based on a four-point scale, with numerical value of 4, 3, 2 and 1. Descriptive statistics was used to analyze the data collected from the study for answering the research question.

RESULTS

Research Question 1

What is the role of water metabolism on health of metalwork craftsmen?

The responses of the respondents to the 20 items of the questionnaire were scored and the mean and standard deviation were computed. The result is showed in table 1.

Table 1 Mean response of the role of water metabolism on health of metalwork craftsmen for job performance and productivity.

| S/N | Roles of water to health include: | X | SD | Remark |
|-----|--|------|------|--------|
| 1 | Mental alertness | 3.15 | 0.78 | Agreed |
| 2 | Good Stamina | 3.22 | 0.82 | Agreed |
| 3 | Fewer headaches | 3.20 | 0.89 | Agreed |
| 4 | Increased energy levels | 3.03 | 0.78 | Agreed |
| 5 | Combats fatigue | 3.15 | 0.68 | Agreed |
| 6 | Clearer skin | 3.04 | 0.63 | Agreed |
| 7 | Helps maintain a healthy weight and body functions | 3.10 | 0.80 | Agreed |
| 8 | | 3.15 | 0.79 | Agreed |
| 9 | To clean the blood as it passes | 3.00 | 0.90 | Agreed |
| 10 | Through the kidneys. | 3.20 | 0.78 | Agreed |
| 11 | To control body temperature. | 3.13 | 0.85 | Agreed |
| 12 | To help in food digestion. | 3.08 | 0.93 | Agreed |
| 13 | To help remove waste products. | 3.17 | 0.61 | Agreed |

The data presented in table 1 revealed that the 13 role of water metabolism on health of metalwork craftsmen for job performance have their mean value ranged from 3.03 to 3.22. This indicated that the mean value of each item was above the cut-off point of 2.50 showing that all the role of water were agreed on by metalwork craftsmen for job performance and productivity. The table also showed that the standard deviations (SD) of the items are within the range of 0.61-0.93.

Research Question 2

What are the effects of inadequate water metabolism on metalwork craftsmen on their job performance?

Table 2 Mean response of the effects of inadequate water metabolism on metalwork craftsmen on their job performance and productivity.

| S/N | Effect of inadequate water consumption include: | X | SD | Remark |
|-----|---|------|------|--------|
| 14 | Light headache | 3.01 | 0.91 | Agreed |
| 15 | Feel sleepy | 3.15 | 0.78 | Agreed |
| 16 | Bit snappy or Irritable. | 3.18 | 0.78 | Agreed |
| 17 | Feel hungry | 3.20 | 0.88 | Agreed |
| 18 | Feel thirsty. | 3.02 | 0.92 | Agreed |
| 19 | Feel a bit dizzy | 3.08 | 0.63 | Agreed |
| 20 | Feel tired. | 3.23 | 0.80 | Agreed |

The data presented in table 2 revealed that the 7 effects of water metabolism on health of metalwork craftsmen for job performance have their mean value ranged from 3.01 to 3.23. This indicated that the mean value of each item was above the cut-off point of 2.50, showing that all the effects of water were agreed on by metalwork craftsmen for job performance. The table also showed that the standard deviations (SD) of the items are within the range of 0.63-0.92.

Discussion

The findings of the study showed that the respondents agreed that the metalwork craftsmen need all 20 roles and effect of water metabolism on health identified. These roles and effects of water to metalwork craftsmen includes Mental alertness, Stamina, Fewer headaches, Increased energy levels, Combats fatigue, Clearer skin, Helps maintain a healthy, weight and body functions, To clean the blood as it passes, through the kidneys, To control body temperature, To help in food digestion and To help remove waste products. Effect of water to metalwork craftsmen also include feel tired, feel a bit dizzy, feel thirsty, feel hungry, bit snappy or irritable, feel sleepy and light headache.

These findings were in agreement with opinion of the International Labor Organization (2012) that there are about 80 million indoor workers employed in a wide range of high-risk manufacturing sectors. Extreme heat in the workplace can significantly reduce the performance of the labor force, and consequently, their production. According to Cooperative Extension Service (2007) Water cushions your joints, and protects your tissues and organs from shock and damage. Water acts as a lubricant for your joints, your mouth and digestive system in saliva, and in your nose, throat, eyes, and stomach.

Conclusion

Based on the findings of the study, the following conclusions were made: For proper job performance, metal work craftsmen need to drink adequate water daily. Experts advocate that it is important to drink at least 8-10 cups of water a day for a healthy body because daily our body loses 2-3 quarts (8-12 cups) of water through sweat, urination, and evaporation through our skin and lungs. Therefore, so far, the metalwork craftsmen work in hot or low humidity environments, drink water often will make one' stay healthy and it will increase their job performance and productivity.

Recommendations

Based on the findings of the study, the following recommendations were made: metalwork craftsmen should not wait until is thirsty to drink water—you may already be slightly dehydrated. Metalwork craftsmen should eat foods with higher water content.

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