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The efficacy of one-time and intermittent intake of coffee as a countermeasure to sleepiness on partially sleep-deprived drivers

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Abstract

Research has been done the effect of coffee on sleepiness . Several studies claim that caffeine is proven to overcome sleepiness . However, little is known about the effect of various methods and amounts of coffee intake on a sleep-deprived person. This study compares the effectiveness of one-time and intermittent intake of coffee to overcome driver sleepiness due to partial sleep deprivation. This study used a within-subject experimental design in a driving simulator. T ere were eight participants, all of whom met certain criteria. The participants' degree of sleepiness w measured objectively and subjectively. Objectively, the degree of sleepiness was measured b sed on alpha, beta, and theta brainwaves using an electroencephalograph (EEG); subjectively, this st y used the Karolinska Sleepiness Scale (KSS). The participants experienced partial sleep deprivatio the night before each experiment. The results of this study support previous studies' findings tha coffee can reduce sleepiness . This study also found differences in the effectiveness of one-time vs.

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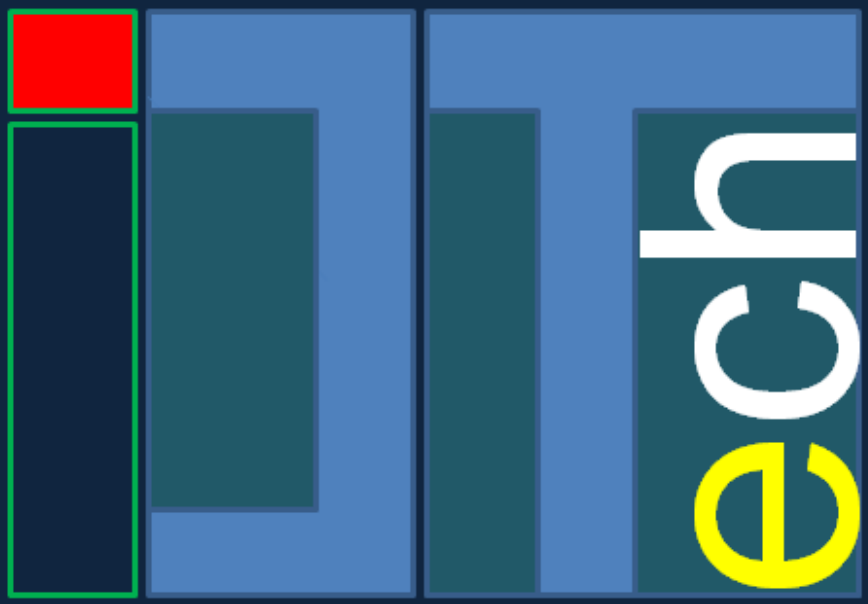

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THE EFFICACY OF ONE-TIME AND INTERMITTENT INTAKE OF COFFEE AS A COUNTERMEASURE TO SLEEPINESS ON PARTIALLY SLEEP-DEPRIVED DRIVERS

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ABSTRACT

Research has been done the effect of coffee on sleepiness. Several studies claim that caffeine is proven to overcome sleepiness. However, little is known about the effect of various methods and amounts of coffee intake on a sleep-deprived person. This study compares the effectiveness of one-time and intermittent intake of coffee to overcome driver sleepiness due to partial sleep deprivation. This study used a within-subject experimental design in a driving simulator. There were eight participants, all of whom met certain criteria. The participants' degree of sleepiness was measured objectively and subjectively. Objectively, the degree of sleepiness was measured based on alpha, beta, and theta brainwaves using an electroencephalograph (EEG); subjectively, this study used the Karolinska Sleepiness Scale (KSS). The participants experienced partial sleep deprivation the night before each experiment. The results of this study support previous studies' findings that coffee can reduce sleepiness. This study also found differences in the effectiveness of one-time vs. intermittent intake of coffee (sig. value for EEG = 0.025; sig. value for KSS = 0.001). For partially sleep-deprived drivers, one-time coffee intake was found to be more effective in counteracting both objective and subjective sleepiness than intermittent coffee intake.

Keywords: Coffee; Countermeasure; Driver; Intake; Sleepiness

1. INTRODUCTION

Traffic accidents are the third most common cause of death in Indonesia (BIN, 2011). The majority of traffic accidents in Indonesia are caused by human factors. One of the human factors that causes accidents is driver sleepiness (Korlantas, 2012). Sleepiness increases the risk of traffic accidents (Cummings et al., 2001). Increased levels of fatigue and sleepiness have been proven to increase driver reaction time and decrease cognitive ability, including reducing the driver's ability to recognize danger signs or to take corrective action (Dinges et al., 1997).

Many studies have found that the caffeine in coffee is an effective countermeasure against sleepiness. The significant difference in several studies on caffeine is that they used different methods to provide coffee to the participants. Several studies provided caffeine in the form of a coffee drink (Horne & Reyner, 1999), while others provided caffeine in the form of a slow-release tablet (De Valck & Cluydts, 2001) or a low-dose capsule that participants took frequently (Wyatt, 2004). One study found that the effects of a slow-release caffeine tablet can be used as a valuable countermeasure to driver sleepiness due to partial sleep deprivation

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DESIGNING A CALL CENTER TRAINING SOFTWARE FOR VISUALLY IMPAIRED USERS

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ABSTRACT

Existing software development studies focus on creating interfaces that cater to improving sensual responses rather than on usability. The variables affecting the performance of visually impaired (VI) individuals in the design of existing software, such as arrangement of design elements, words used in the interface and allowing action reversal were investigated to improve task completion time, number of errors committed and overall satisfaction. Two interface designs of a telephone survey system were developed considering published usability and accessibility guidelines in literature. A total of 30 participants used the software and performed three tasks. Results of the usability test showed that the lowest overall task time was achieved by the current design followed by the panel design. The panel design produced the least number of errors committed. However, VI participants preferred the tab interface because it is more organized.

Keywords: Design; Software design; Usability; User-centered design; Visually- impaired

1. INTRODUCTION

Visual Impairment (VI) is defined as the consequence of a functional loss of vision (Disabled World, 2014). It describes any kind of vision loss that includes partial vision loss up to total blindness (The Nemours Foundation, 2010). Aside from difficulty in seeing there is nothing inherently wrong with visually impaired people, especially as workers (Omvig, 2005). If provided with appropriate training and assistive tools, their ability can be compared to typical workers in performing and accomplishing tasks.

With the current trends in technology, steps have been undertaken to enable the VI population to gain access to information. Assistive devices like screen readers or braille displays have been developed to help visually impaired people to surf the Internet (Abichandani et al., 2009). However, there are only very few VI individuals, who are braille-literate (Belisomo, 2015). Screen readers are good alternatives, but these are language dependent, making it difficult for VI people to have full access to computers (Pavesic et al., 2003). Moreover, screen readers cannot read the texts that are embedded in the graphics based on an interview with a VI person. Assistive devices, therefore, are still insufficient to address the challenges faced by the VI population.

Computer software available in the market is designed on the assumption that users have no disability and are physically able to perceive information from the monitor and manipulate the

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EVALUATION OF CHILDREN'S ANTHROPOMETRIC MEASURES IN RURAL AND URBAN AREAS FOR ERGONOMIC APPLICATION

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ABSTRACT

The prominent issue of the mismatches of children's body dimensions with school furniture has made people realize the essential factors of providing ergonomic furniture. By evaluating rural and urban areas, school furniture can be designed for both areas based on their anthropometrics, thereby combating mismatches. This quantitative study focused on four regions in Malaysia. A total sample of 2,400 primary school children from seven to eleven years old from both rural and urban schools was evaluated. Six anthropometric aspects were measured: stature, subscapular height, shoulder breadth, hip width, buttock popliteal length, and popliteal height. The measurements were evaluated using SPSS, with which T-tests were performed, to evaluate the anthropometric differences between each province. Each region showed different results when its rural and urban areas were compared. This reveals that anthropometrics are different in certain areas, even when they are in the same country. The importance of knowing such matters will help to ease the sizing of products (such as furniture) based on location, hence, making ergonomic products possible.

Keywords: Anthropometrics; Children; Ergonomic; Urban; Rural

1. INTRODUCTION

Anthropometrics is an essential factor that needs to be fulfilled in order to claim that a product is ergonomic. It is important to collect anthropometric data, which differ among ethnicity (Lin et al., 2004), age groups, and cultures (Panagiotopoulou et al., 2004), as well as gender and population (Chandel & Malik, 2011). Ergonomics, which is a discipline of the understanding of interactions between humans and other elements to optimize performance (Dul & Weerdmeester, 2008), must be applied to all ages. Even though ergonomics concentrated on adults first, where it was applied to war equipment and industrial manufacturing (Helander, 1997), numerous studies concerning children have been done more recently. Furthermore, the increase of musculoskeletal disorders in children has made people realize the importance of providing ergonomic features in children's environments, especially in schools, where they spend most of their time (Ismail et al., 2009). In Malaysia, studies have unraveled mismatches between children and school furniture, where a majority of the research showed a high volume of mismatch (Isa et al, 2013). However, very few studies on the comparison of school children in rural and urban areas have been done**.** The term "rural" varies from place to place. It often refers to areas in a country that are less densely populated. There are different types of rural areas,

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