

Ergonomic rucksack design for elementary school students in Indonesia to minimise low back pain

*Johanna Renny Octavia Hariandja, Bagus Arthaya, & Nana Suryani
Department of Industrial Engineering
Parahyangan Catholic University
Bandung, Indonesia*

Abstract

Curriculum development in Indonesia had brought some new issues in the daily school life of students. In elementary school, the course subjects became so much extended that every subject needed two to three reference books. The students were ought to bring more books to school every day, with the result that youngsters between 6 and 12 years old had to carry heavy loads. Among many types of school bags, the rucksack was the most preferred in usage among the elementary school students because it could hold the heavy loads and gave a more symmetrical load distribution to the human body. The preference for rucksacks led to competition amongst school bag designers in Indonesia to produce rucksacks in many models. Unfortunately, the designers did not take ergonomics into consideration seriously in the design of the rucksacks. Low back pain was one of the effects associated most often with the use of rucksacks that were not designed ergonomically. This was even more risky for the elementary school students because their bones were still growing. This study focused on creating a prototype of an ergonomic rucksack for elementary school students in Indonesia. The goal was to make the rucksack comfortable to the users and minimise the chances to get low back pains.

Introduction

In elementary schools in Indonesia, school curriculum development impacts greatly on many practices in daily school life. One development is that the course subjects become much extended. Every student has to bring two to three reference books for each subject. This results in the obligation to bring a large amount of books every schoolday, which means that they have to cope daily with carrying a heavy load on their back for a long time. Facing this problem, the students tend to choose a large school bag which can enable them to carry the heavy load.

Nowadays in Indonesia, the rucksack is the most popular school bag used by elementary school students. Double-strap rucksacks give a more symmetrical load distribution to the human body and make the load much lighter to carry. For elementary school students, their consideration in choosing a rucksack is likely based on the brand and physical attributes such as shape, size, colour and accessories. This

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