Research Paper :

Physiological workload of fetching water

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ABSTRACT

Fetching of water is one of the common household activities of Assam. An attempt was made to assess the physical characteristic, physiological workload and physiological cost of fetching water on the basis of heart rate and energy expenditure of the respondents. Thirty respondents were selected in the age group of 21 - 30 years and 31 - 40 years having normal body temperature, blood pressure and heart rate. There was no difference between the age groups in terms of BMI. On the basis of average and peak heart rate (beats/min) and energy expenditure (kJ/min^{-1}), the physiological workload of fetching water was categorized as 'light' to 'very heavy' activity. Average rating perceived exertion (RPE) ranged from 2.2 to 3.2 in 5 point scale. Angle of deviations was found to be more in younger age group than older age group while drawing water. Incidence of pain was more in low back region of the respondents.

Key words : Drudgery prone, Ergometer, Postural analysis, Physiological workload, Perceived exertion.

Rural women are responsible for multiple labour intensive and time consuming chores, both inside and outside their households. They perform the activities such as fetching water, cooking, washing vessels, washing clothes, sweeping, mopping, bringing firewood, childcare activities, weaving etc. The long hours of works, much effort and labour spent in repetitive home operations results in fatigue and drudgery. A physically fit person with normal physical characteristics influence the person's capacity to do the work and may experience less drudgery for the same amount of work than physically unfit persons. Knowledge of physiological workload of various household operations as they are traditionally performed in the rural homes is of great practical values in order to provide comfort and consequently to promote health and well beings of the home makers. A good working posture reduces the physiological cost of work and fatigue to a minimum, where in static muscular efforts and incorrect postures for long period during households operations can lead to musculoskeletal problems. Knowledge of physical cost of work in terms of heart rate and energy expenditure of rural women will be of great use in providing necessary changes required in the work environment, work place and methods of performing the task.

Fetching of water is one of the common household activities performed by rural women in Assam. The extent of drudgery involved in the activity was determined through assessment of physical fitness, physiological workload and musculoskeletal problems of rural women.

METHODOLOGY

A sample of 30 rural women having normal pressure and temperature in the age group of 21-40 years was selected from Jorhat district of upper Brahmaputra Valley Zone of Assam.

Body composition :

Estimation of Lean Body Mass (LBM) was determined from skin fold thickness at four sites ie. biceps, triceps, subscapular and superilliac with the help of skinfold calipers by using the methods proposed by Durmin and Rahman (1967). BMI for Quetlet's Index Weight (kg) / Height (m^2) was used to classify the body types as Ectomorph($<$20), Mesomorph(20-25) and Endomorph ($>$25).

Determination of physical fitness :

Step-test method was used for determining physical fitness of the respondents. The test was administered according to designed protocol, resting, working and recovery heart rate were monitored continuously by using Heart Rate Monitor (Polar Sports Tester- PE 4000) during all the three phases. The stepping exercise (30 steps/min) was continued for a period of five minutes. The recovery pulse rate was recorded while the subjects were sittings completely on a chairs. PFI was measured with the score obtained from stepping exercise and was interpreted using the physical fitness index.

Poor physical fitness (up to 80), low average (81-100), high average (101-115), good (116-135), very good