

Abstract of thesis presented to the Senate of Universiti Malaysia Terengganu in fulfilment of the requirements for the degree of Master of Science

ASSOCIATION OF DIETARY INTAKES, NUTRITIONAL STATUS AND PHYSICAL ACTIVITY ON COGNITIVE PERFORMANCES AMONG FISHERMEN'S CHILDREN IN TERENGGANU

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Low cognitive performance is a primary concern among fishermen's children in Terengganu. Thus, this study evaluated the risk of dietary intake, nutritional status, physical activity, and associated factors on cognitive performance among fishermen's children aged 7 to 11 in Kuala Terengganu and Kuala Nerus. A questionnaire was used to retrieve the participants' sociodemographic data. Subsequently, a 24-hour dietary recall was conducted over two days (one weekday and one weekend) to ascertain their dietary intake and adequacy. The participants' anthropometric measurements were obtained by determining their height-for-age and body mass index (BMI)-for-age, and median urinary iodine was also performed. The Physical Activity Questionnaire for Children (PAQ-C) was used to measure the participants' physical activity and divided them into three categories: low, moderate, and high. The Raven's Coloured Progressive Matrices score classified their cognitive performance as follows: intellectually superior, above average, average, below average, or intellectually impaired. The findings indicated that the participants had adequate intake of all necessary nutrients except for fat, dietary fibre, thiamine, folate, vitamin C, vitamin E, calcium, zinc, and potassium. Majority have normal height-for-age (Mean = -1.01 ± 1.03) and BMI-for-age [Median = $-0.86 (2.11)$], but 56.4% were iodine deficient [Median = 83.9 (102)]. Furthermore, 75.5% of the participants engaged in moderate physical activity (Mean

= 2.84 ± 0.577), while their cognitive performance was below average [Median = 80.0 (21.0)]. Moreover, there was a significant relationship between cognitive performance and the mother's education level ($\chi^2(2, N=94) = 0.050, p = 0.037$), BMI-for-age ($\chi^2(2, N=94) = 6.271, p = 0.012$), protein ($\chi^2(2, N=94) = 5.407, p = 0.020$), and niacin ($\chi^2(2, N=94) = 4.608, p = 0.032$). Out of the four variables, BMI-for-age (OR = 0.290, 95% CI [0.91,0.920], $p = 0.036$) and fourth quartiles of protein intake ($\geq 52.69\text{g}$) (dummy variable for '*protein*') (OR = 7.565, 95% CI [1.470,38.926], $p = 0.015$) were identified as major risk factors for low cognitive performance among the participants. In summary, a balanced diet and healthy lifestyles are crucial for a child's growth and development, particularly their cognitive development. Thus, interventions emphasising the promotion of healthy lifestyles, particularly focusing on BMI-for-age and protein intake, are advised.

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HUBUNGKAIT ANTARA PENGAMBILAN PEMAKANAN, STATUS PEMAKANAN DAN AKTIVITI FIZIKAL TERHADAP PRESTASI KOGNITIF DALAM KALANGAN ANAK-ANAK NELAYAN DI TERENGGANU

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Prestasi kognitif yang rendah merupakan kebimbangan utama dalam kalangan anak-anak nelayan di Malaysia. Oleh itu, kajian ini menilai risiko pengambilan diet, status pemakanan, aktiviti fizikal, dan faktor-faktor yang berkaitan dengan prestasi kognitif dalam kalangan anak-anak nelayan berumur tujuh hingga 11 tahun di Kuala Terengganu dan Kuala Nerus. Soal selidik telah digunakan untuk mendapatkan data sosiodemografik peserta. Peningkatan kembali diet 24 jam telah dijalankan selama dua hari (satu hari dalam hari bekerja dan satu hari pada hujung minggu) untuk memastikan pengambilan dan kecukupan diet. Ukuran antropometrik peserta diperoleh dengan menentukan ketinggian-untuk-umur dan indeks jisim tubuh (BMI)-untuk-umur, serta ujian median air kencing iodin. Soal Selidik Aktiviti Fizikal untuk Kanak-kanak (PAQ-C) digunakan untuk mengukur aktiviti fizikal yang dibahagikan kepada tiga kategori: rendah, sederhana dan tinggi. Matriks Progresif Berwarna Raven digunakan untuk mengukur keupayaan kognitif para peserta seperti berikut: melebihi purata, purata, di bawah purata atau cacat intelektual. Penemuan menunjukkan bahawa para peserta mempunyai pengambilan nutrien yang mencukupi kecuali lemak, serat makanan, tiamin, folat, vitamin C, vitamin E, kalsium, zink dan kalium. Kebanyakan

peserta mempunyai ketinggian normal mengikut umur (Min = 1.01 ± 1.03) dan BMI-untuk-umur (Median = $-0.86 (2.11)$), tetapi 56.4% kekurangan iodine [Median = 83.9 (102)]. Tambahan pula, 75.5% para peserta terlibat dalam aktiviti fizikal sederhana (Min = 2.84 ± 0.577), manakala prestasi kognitif mereka diklasifikasikan di bawah purata [Median = 80.0 (21.0)]. Selain itu, terdapat perhubungan yang nyata antara prestasi kognitif dan tahap pendidikan ibu ($\chi^2(2, N=94) = 0.050, p = 0.037$), BMI-untuk-umur ($\chi^2(2, N=94) = 6.271, p=0.012$), protein ($\chi^2(2, N=94) = 5.407, p = 0.020$), dan niasin ($\chi^2(2, N=94) = 4.608, p = 0.032$). Antara empat pembolehubah tersebut, BMI-untuk-umur (OR = 0.290, 95%CI [0.91,0.920], $p = 0.036$) dan kuartil keempat pengambilan protein ($\geq 52.69g$) (pembolehubah dummy untuk 'protein') (OR = 7.565, 95%CI [1.470,38.926], $p = 0.015$) dikenal pasti sebagai faktor risiko utama yang menyumbang kepada prestasi kognitif rendah dalam kalangan peserta. Secara tuntasnya, diet seimbang dan gaya hidup sihat adalah penting untuk pertumbuhan dan perkembangan kanak-kanak, terutamanya perkembangan kognitif mereka. Oleh itu, intervensi yang menekankan promosi gaya hidup sihat, terutamanya memberi tumpuan kepada BMI-untuk-umur dan pengambilan protein, adalah dinasihatkan.