DIETARY ASSESSMENT, NUTRITIONAL BIOMARKERS AND PREVALENCE OF METABOLIC SYNDROME AMONG ADOLESCENTS IN GUSAU URBAN AREA, ZAMFARA STATE, NIGERIA

BY

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ABSTRACT

There is an increasing prevalence of metabolic syndrome among adolescents globally. In Nigeria, early detection using nutritional biomarkers: serum uric acid (SUA), serum sodium-to-potassium ratio (Na:K) and serum albumin (SALB) may be a promising and preventive measure in nutrition sciences. This study investigated the dietary assessment, nutritional biomarkers and prevalence of metabolic syndrome among adolescents in Gusau urban area, Zamfara State. The study is cross-sectional in design, where 400 respondents were selected from 6 private and 5 public secondary schools in Gusau Urban Area, Zamfara State using stratified proportionate and random sampling techniques. Nutrient intake was assessed using 24-hour dietary recall questionnaire. Food consumption pattern was assessed using food frequency and diet history questionnaires. Anthropometry was assessed using standard instruments and biochemical parameters (nutritional biomarkers and metabolic syndrome components (MetS); blood pressure, fasting blood glucose (FBS), total cholesterol (TCH), triglycerides (TRIG), high density lipoproteins (HDL) and low lipoproteins (LDL) were measured using standard methods. BMI-for-Age was calculated using WHO AnthroPlus. Nutrient intakes were obtained from the 24-hour diet recall using NutriSurvey software. Data were analysed using frequency counts, percentages, mean and standard deviation. Pearson's bivariate correlation and multiple linear regression models were used to test for association among variables at $p \leq 0.05$. Results showed that 58.5% of respondents were within 15-19 years, 68.25% were males. The median energy intake for males and females were 1241.15 kcal and 1107.63 kcal, and 1285.62 kcal and 1299.79 kcal, respectively for adolescents of 10-14, and 15-19 years. Sixty-eight percent of the respondents ate thrice a day. Pap was the most consumed for breakfast. Cereals were the most consumed food group. Mean MetS components and

nutritional biomarkers were within the normal range except Na:K ratio which was elevated among females 10-14 years. The overall prevalence of MetS was 3.0%. Carbohydrate correlated positively with diastolic blood pressure (DBP) (r= 0.269) in males 10-14 years. Females 10-14 years had 5.3% obese (≤+3SD) BMI-for-Age. SUA was positively correlated with LDL (r= .548**) and TCH (r= .360*) in males 10-14 years, with a positive relationship with SBP (r = .391**) and DBP (r= .336*) in females (10-14). In males 15-19 years, SUA had a positive relationship with HDL (r= .337**), LDL(r=.337**), TRIG (r=.333**) and TCH (r= .484**). Serum sodium-to-potassium ratio correlated positively with LDL (r=.268*). Serum albumin correlated with TRIG (r=.371*) and TCH (r=.358*). Serum uric acid predicted elevated LDL at 12% variation with ($p \leq 0.01$) level, R^2=0.120, F(8.994).201. Serum uric acid and albumin predicted elevated TRIG at 10.6% variation with ($p \leq 0.03$) and ($p \leq 0.01$) level. R^2=0.106, F(7.854).201 and TCH at 17.2% variation with ($p \leq 0.01$) level. R^2=0.172, F(13.665).201, respectively. There was a significant ($p \leq 0.05$) relationship between nutritional status, nutritional biomarkers and metabolic syndrome components in adolescents. High serum uric acid and albumin levels were identified as predictors of metabolic syndrome, highlighting the importance of monitoring these biomarkers in adolescent health assessments. Sodium-potassium ratio appeared unrelated to metabolic risk. Diet and lifestyle as modifiable factors should be the pivot for nutrition education intervention for adolescents.