

ABSTRACT

Sedentary behaviors are one of the more serious yet insufficiently addressed public health problems. The knowledge needed to inform future evidence-based interventions and national guidelines that specifically target sedentary behavior with physical activity pattern among adolescents are extremely limited in Sri Lanka and this alarming situation needs to be addressed. The non availability of a validated study instrument exclusively designed to make available a comprehensive range of sedentary behavior information is another hidden aspect in this regard. Due to this dearth of information, a call for a more extensive body of epidemiological research on sedentary behavior and physical activity and its' risk for overweight have been made recently.

The objectives of this research were to translate and validate a questionnaire to assess sedentary behavior among adolescents. Also to describe both the pattern of sedentary behaviours during leisure time and physical activity and to determine its risk for overweight among school children aged 14-15 years in the Kalutara District. The study included three components - a validation study, a cross sectional study and a case control study.

The study revealed that the Adolescent Sedentary Activity Questionnaire (ASAQ-S) is a valid tool to assess sedentary behavior with the results showing Intra class Correlation Coefficient(ICC) of 0.53 (95 % CI of 0.08, 0.78) after performing a criterion validity assessment using an accelerometer as the gold standard among 42, randomly selected school children aged 14-15 years. Its reliability assessment showed as 0.89 (95% CI: 0.7.0.8) of Intra class Correlation Coefficient with significant results for a total week of sedentary time.

The cross sectional survey was carried out among a sample of 1795, recruited using multistage cluster sampling with probability proportionate to the size of the 14-15 years aged school children in government schools in the District of Kalutara. A total of 90 clusters were included and cluster size was twenty participants in the class room. The pattern of sedentary behavior was assessed by inquiring on the time spent on 14 different types of sedentary activities across the week days and weekends by using the validated ASAQ-S. The results revealed that 95.2% of adolescents were engaged in sedentary activities for ≥ 4 hours per day during an average week. During week days 92.1%, and on weekends 96.4% of adolescents were sedentary for ≥ 4 hours per day. Females were more sedentary than males for ≥ 4 hours per day (97% and 93%

respectively) with the significant P value of <0.001 . A higher proportion of overweight participants were sedentary for ≥ 4 hours per day than normal weight and underweight participants shown as 97%, 94%, and 96% respectively with significant difference of P value as 0.03.

The mean duration of sedentary hours during a normal day among the adolescents showed as 9.89 ± 3.02 hours per day. For week days it was 8.26 ± 2.84 , and for weekends 11.52 ± 3.92 with statistically significant difference ($P < 0.001$). In addition, adolescents were engaged 70.6 % of the day in sedentary activities. TV viewing was the single most popular sedentary behaviour during weekends and doing home work was during week days. TV viewing time revealed 1.6 hours per day during week days and 2 hours per day during weekends among both sex: Adolescents 17.6% were spent ≥ 4 hours per day on watching TV during the weekend and only 6.1% did the same during week days. During week days while 58.5% spent less than 2 hours per day doing home work, 36.6% of participants spent time for ≥ 2 hours per day and 4.9% were not.

The pattern of physical activity was assessed using the validated Physical Activity Questionnaire - S in this component of the study too. Only 33.1% of the adolescents were participating in moderate - to vigorous - physical activity (MVPA) for at least 60 minutes per day for 5 or more days per week and were categorized as sufficiently active. Accordingly only 30.6 % female participants and 35.1% among the male participants were sufficiently active with significant difference ($P = 0.05$). At the same time more urban schools participants (35.1 %) were sufficiently physically active than rural participants (30.6 %) with a significant result ($P: 0.01$). Only 26.7% of overweight participants were sufficiently active showing significant difference with normal (35.1%) and underweight group (30%) with P value of 0.02.

The risk factors of overweight were assessed in relation to the level of sedentary behavior during leisure time and the level of physical activity in the case control component of the study. In this component of the study 176 overweight participants defined as cases and 704 normal weight participants were selected as 4 controls per case. Univariate analysis followed by logistic regression analysis was carried out to identify the independent risk factors for overweight adjusted for confounding effect. The strongest risk for overweight was indicated for those who watched Video/DVDs for ≥ 2 hours duration with 3.1 time of risk for becoming overweight than those who

watched for less than 2 hours (95% CI:1.8-5.3; P value : <0.001). Watching TV for ≥ 2 hours showed the risk for overweight as 2.6 with 95% CI of 1.7- 3.8 and P value of <0.001. Doing home work for ≥ 2 hours showed 1.8 times risk for over weight than those who spent less than 2 hours on home work (95% CI: 1.2, 2.7; P: <0.001). When considering the pattern of physical activity it was found that there was 1.6 times risk of overweight with insufficient physical activity adolescents than those who were sufficiently active by participating in moderate- to vigorous- physical activity (MVPA) for at least 60 minutes per day for 5 or more days per week (95% CI: 1.1, 2.4 and P value of 0.03).

The Three-Day Dietary Record which was validated for the local setting was used to assess the participants' food consumption. Study results revealed that consumption of pulses and seeds (OR; 0.5.; 95% CI: 0.3.0.7), and both vegetable and fruits (OR: 0.06, 95% CI 0.4, 0.9) had a protective effect for the overweight than non consumption, after controlling the confounding effects. Also results showed consumption of meat (OR:1.9; 95% CI: 1.2, 3.1), fish or other sea foods (OR: 1.6; 95% CI: 1.1, 2.8), fast food, fried rice and oily foods (OR:1.9; 95% CI: 1.2, 2.9), Carbonated drinks sweetened drinks, ice packets (OR:1.9; 95% CI: 1.2,2.8), and Sweets, biscuits, ice packet (OR:1.8; 95% CI 1.2, 2.7) have a higher risk for over weight than those who did not consume.

It is concluded that the pattern of sedentary behavior during leisure time among school children aged 14-15 years showed undesirable high levels with types of activity, duration of activity and week day/weekend variation, sex, and sector of the school. Physical activity pattern showed low levels of sufficiently active as recommended. Their unhealthy levels of engagements in these activities showed positive risk for overweight and this has to be considered as an alarming but hidden public health problem. Awareness should be created among the community and the general public regarding the adverse health outcomes in relation to all the age categories as an important strategy for the prevention of NCDs.

Key words: adolescents, sedentary behaviours, physical activity, risk factors of overweight.

