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RESEARCH PAPER

KNOWLEDGE ON NON COMMUNICABLE DISEASES AMONG ADVANCED LEVEL SCHOOL CHILDREN IN THE ANURADHAPURA MUNICIPAL COUNCIL AREA IN SRI LANKA

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Abstract

Background: The lifestyles of residents of Anuradhapura, a rural area in Sri Lanka, has changed from active farming based ones to more sedentary ones. Although data is available on non communicable diseases (NCDs) in urban areas of Sri Lanka, data from rural areas are lacking.

Objectives: The objective of this study was to evaluate the knowledge on NCDs among advanced level children schooling in the Anuradhapura Municipal Council area.

Methods: This was a cross sectional study conducted among school children (n=106; age16±1years) in Anuradhapura, using a self administered questionnaire.

Results: Among the participants, 11% was not aware that NCD cannot spread between people. Almost 90% knew that a sedentary life style is a risk factor for NCDs. A significant percentage (35%) either did not know or had given the incorrect answer regarding the time duration that a person should spend on exercises per day. Nearly one fifth were unaware about the body mass index (BMI), 33% did not know how to measure BMI and 28% either did not know or had given the incorrect answer regarding the normal range of BMI for Sri Lankans. Of the participants, 38.6% did not know that childhood obesity or malnutrition are risk factors for NCDs and 57% did not know that maternal malnutrition could give rise to NCDs in children. Twenty eight percent were unaware that mental stress is a risk factor for NCDs. More than 30% did not know that early detection of breast and cervical cancers would lead to a better outcome.

Conclusions: The present study population had an average knowledge regarding NCDs. However, knowledge on dietary habits, physical activities and alcohol and tobacco use is yet to be improved.

Keywords: non communicable diseases, knowledge and attitudes, dietary habits, physical activity

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Introduction

According to reports by the World Health Organization (WHO), more than 75% of deaths in Sri Lanka are due to non communicable diseases (NCDs). Nearly 1 in 5 people die prematurely due to a NCD. In Sri Lanka, the death rate due to cardio vascular diseases, cancers, diabetes, chronic respiratory diseases and other NCDs are 40%, 10%, 7%, 8%, 10% respectively[1]. This rising burden of NCD significantly affects the socio-economical development of the country. Tobacco use, unhealthy dietary practices, sedentary life styles and harmful use of alcohol are the main predisposing factors for NCDs in middle and low income countries[1]. Based on the data of the Population Reference Bureau 2016, among other risk factors for NCDs, low physical activity will become the most decisive risk factor for future NCDs in Sri Lanka, as 83% of males and 89% females between the ages of 13 to 15 years have low physical activity[2].

According to data from 2011, the prevalence of diabetes in the North Central province of Sri Lanka was 9.6%. In comparison to the Uva Province, another rural area which had a comparable mean energy consumption of the population, the prevelance of diabetes was higher in the North Central Province (6.8% vs 9.6% respectively)[3]. Anuradhapura is the capital of the North Central Province and in recent years there has been significant change of lifestyles in this area, from an agricultural environment towards a more non-agricultural sedentary framework[4,5]. Since changes in lifestyle, dietary patterns and physical activity could worsen the burden of NCDs even in rural areas in Sri Lanka, people should be educated regarding the prevention of NCDs.

The World Health Organization (WHO) reports that behavior begun at the adolescent age is responsible for 70% of premature deaths in adults in the world[2]. Previous researchers have emphasized "adolescence" as the phase where healthy positive behaviors should be implemented and supported, as behaviors developed during this phase of life are often carried up to the adulthood[2]. Furthermore, unhealthy dietary habits, alcohol and tobacco use and substance abuse developed during this phase of life are likely to persist throughout life and are difficult to change[2]. Therefore, improvements in the knowledge on NCDs and practices among adolescents are crucial measures to prevent NCDs and to reduce the burden of these diseases.

Although there is published data on the awareness on NCDs among school children in other countries, data is lacking in the Sri Lankan context. In Sri Lanka, nearly 79% of students continue their studies in Advanced level after ordinary level examination[6]. Therefore, we recruited adolescents from advanced level classes from government schools in the Anuradhapura Municipal Council area for the present study, to explore their level of knowledge and attitudes towards NCDs.

Methodology

This was a self-administered questionnaire based cross sectional study.

The sample size was calculated to be 66. The questionnaire was developed according to WHO STEP wise approach to chronic disease risk factor surveillance[1]. It was pretested and developed in the participants' native mother tongue (Sinhala/ Tamil/ English). The questionnaire contained 4 sections, namely, sections on 1) demographic data, 2) general knowledge on NCDs, 3) knowledge on risk factors for NCDs (including knowledge on dietary habits) and 4) knowledge on hypertension, cardio vascular diseases, diabetes and cervical cancers. Answers included some questions requiring "Yes", "No" and "Don't know" responses, as well questions

that required value ranges (i.e., for questions on BMI, time spent on physical activities etc.).

Advanced level students (grade 12) were selected by simple random sampling method from each stream from five government schools; and the schools too were selected using simple random sampling from among all schools in the Anuradhapura Municipal Council area. Questionnaires were distributed to the participants, to be filled within 30 minutes, without using any referencing or data mining. Data were presented as percentages.

Ethical approval for the study was obtained from the Ethics Review Committee of the Faculty of Medicine and Allied Sciences, Rajarata University of Sri Lanka (ERC/2016/71).

Results

A hundred and six participants with a mean age of 16 years (SD1) were recruited. Fifty four (50.9%) were males (Table 1). The percentage of students who had given correct answers for the questions on general knowledge on NCDs is shown in table 2. From among the participants, 11% was not aware (either said "do not know" or given the wrong answer) that NCDs cannot spread between people and 18% was not aware of the significant public health problem being caused by NCDs in Sri Lanka.

The percentage of students who have given correct answers for the questions on risk factors for NCDs is shown in Table 3. Almost 60% knew plant oils are healthier than animal oils. A majority did not know that skimmed milk is the healthier type of milk, which contains more nutrients per volume. However, a majority (93.4%) were aware that certain oils are not suitable for reuse and about the importance of fruits in the diet (98%). More than 10% were not aware that smoking, alcohol and unhealthy dietary habits are risk factors for NCDs.

Almost 90% knew that sedentary life style is a risk factor for NCDs. A significant percentage of students (35%) either did not know or had given the incorrect answer for the time duration that a person should spend for exercises per day. One fifth of students considered certain activities such as cooking and washing clothes, which are not considered exercises, as exercises.

Nearly one fifth [19% (18/106)] of students were unaware about body mass index (BMI), 33% (35/106) did not know how to measure BMI and 28% (30/106) either did not know or had given the incorrect answer for the normal range of BMI for Sri Lankans. Childhood obesity or malnutrition were not recognized as risk factors for NCDs by 38.6%, and 57% did not know that maternal malnutrition could give rise to NCDs in children. Twenty eight percent was unaware (either said "do not know" or had given the wrong answer) that mental stress is a risk factor for NCDs.

Table 1: Socio demographic data

Characteristic		**Mean/SD or N(%)**
Age		16±1 years
Gender	Male	54 (50.9%);
	Female	52 (49.0%)
Study stream	Bio Science stream	20 (18.8%)
	Physical Science stream	35 (33%)
	Commerce stream	21 (19.8%)
	Arts stream	30 (28.3%)

Table 2: Percentage of students who have given correct answers for the questions on general knowledge

Question	Bio Science (n=20)	Physical Science (n=35)	Commerce (n=21)	Arts (n=30)	Total % (n=106)
NCDs cannot spread between people	18 (90%)	33 (92%)	19 (90%)	24 (80%)	88.7%
NCDs are common among Sri Lankans	18 (90%)	27 (77%)	18 (86%)	24 (80%)	82.1%

However, compared to students in the other three streams, students in the bio science stream possessed better knowledge on tobacco and alcohol use and had correctly answered certain questions related to diet. The percentage of students who have given correct answers for the questions related to knowledge on NCDs is shown in Table 4.

From the participants, 36% was unaware that high salt consumption has a relationship with hypertension. Smoking and stress were identified as risk factors for cardio vascular diseases (CVD) by only 60% and 55% respectively. The fact that a positive family history increases the risk of CVD and diabetes was known by 22% and 46% respectively. More than 40% were not aware that diabetes can adversely affect the eyes and kidneys. Half of the population (52%) did not know (24%) or did not believe (27%) that there are home remedies and herbs which can reduce blood glucose; of the students who did not believe the effects of home remedies, 93% were students doing science subjects. Sixteen percent (17/106) of students were not aware that diabetes is related to elevated blood glucose levels.

More than 30% did not know that early detection of breast and cervical cancers improves prognosis. However, compared to students in the other three streams, students in the bio science stream had a better knowledge regarding hypertension and diabetes.

Discussion

In the present study, although 11% was not aware that NCD cannot spread between people and 18% was not aware of the burden caused by NCDs among Sri Lankans, a known family history of NCD was present in 38.7% (41/106) of students. From among the participants, 19% (20/106), 13% (14/106) and 4% (4/106) had family histories of diabetes, hypertension and chronic kidney disease respectively.

According to the WHO, 3.3 million deaths in the world in 2012 were due to alcohol consumption and more than half of these deaths were related to NCDs[2]. In 2011, the percentage of 13-15 year old school children in Sri Lanka who used at least one product of tobacco was 16% in males and 5% in females[2]. Although alcohol and tobacco consumption is rising among adolescents in Sri Lanka[2], [8] this study shows that almost 90% of the participating

advanced level students were aware that alcohol and tobacco use are risk factors for NCDs. From this population, almost 80% knew NCDs cause a significant health impact to Sri Lankan community. While knowing the risks, the reasons for the increase in alcohol and tobacco use among adolescents in Sri Lanka could be due to the socio demographic factors (i.e., having parents or friends who smoke) and the insufficiency of the impact of the education they gain through different subject streams (i.e., although students following non-science subjects knew that alcohol and tobacco use influence NCDs, the actual impact of these risk factors on human health might not be sufficiently incorporated in to those syllabuses). This was further proven by a study conducted in 2015 among school children in Colombo district. It revealed that the mean age of starting to smoke was 14-16 years. Male gender, parental smoking, studying non-science subjects, peer smoking, and participating in sports were significantly associated with smoking of at least 1 complete cigarette ($p<.05$) on univariate analysis; and significant correlations were observed with having close friends or parents who smoke on multi variate

Table 3: Students who have given correct answers for the questions on risk factors

	Question	Bio Science (n=20)	Physical Science (n=35)	Commerce (n=21)	Arts (n=30)	Total % (n=106)
Tobacco and alcohol use	Smoking cause NCDs	20 (100%)	31 (89%)	16 (76%)	27 (90%)	88.7%
	Alcohol cause NCDs	19 (95%)	29 (83%)	19 (90%)	25 (83%)	86.8%
Diet	Dietary habits cause NCDs	20 (100%)	29 (83%)	16 (76%)	27 (90%)	86.8%
	Daily fruit consumption is essential	20 (100%)	34 (97%)	21 (100%)	29 (97%)	98.1%
	Skimmed milk is better than full cream milk or calcium fortified milk	9 (45%)	12 (34%)	11 (52%)	7 (23%)	36.8%
	Junk food consumption cause NCDs	19 (95%)	31 (89%)	15 (71%)	27 (90%)	86.8%
	Plant oils are more healthier than animal oils	13 (65%)	22 (63%)	13 (62%)	17 (57%)	61.3%
	Reuse of certain cooking oils is not safe	20 (100%)	30 (86%)	21 (100%)	28 (93%)	93.4%
Exercise	Sedentary life style cause NCDs	20 (100%)	34 (97%)	15 (71%)	27 (90%)	90.6%
	Time a person should spend for exercises	13 (65%)	22 (63%)	15 (71%)	19 (63%)	65%
Weight	Control of body weight is important to prevent from NCDs	15 (75%)	28 (80%)	19 (90%)	24 (80%)	81.2%
	Childhood obesity and malnutrition cause NCDs	15 (75%)	21 (60%)	12 (57%)	17 (57%)	61.4%
	Maternal nutrition has an effect on NCDs	9 (45%)	15 (43%)	5 (24%)	12 (40%)	38.7%
Stress	Mental stress is a risk factor for NCDs	18 (90%)	25 (71%)	13 (62%)	20 (67%)	71.7%

analysis. Female smoking has increased from previously reported values[9]. Although not significant (p>0.05), in this study too, students who follow the bio science stream had a better knowledge compared to students in other streams.

Table 4: Percentage of students who have given correct answers for the questions on NCDs

	Question	Bio Science (n=20)	Physical Science (n=35)	Commerce (n=21)	Arts (n=30)	Total (n=106)
Hypertension	Eating high amount of salt increase hypertension	17 (85%)	19 (54%)	15 (71%)	17 (57%)	64%
	Hypertension cause health problems	20 (100%)	33 (94%)	16 (76%)	25 (83%)	89%
CVD	Smoking causes CVDs	9 (45%)	18 (51%)	19 (90%)	18 (60%)	60%
	Stress cause CVDs	13 (65%)	17 (49%)	17 (81%)	11 (37%)	55%
	Having a family member with CVD, increase the risk of having CVD in you	6 (30%)	4 (11%)	7 (33%)	6 (20%)	22%
Diabetes	Diabetes affect eyes	13 (65%)	17 (49%)	1 (5%)	7 (23%)	37%
	Diabetes affect kidneys	16 (80%)	22 (63%)	8 (38%)	15 (50%)	58%
	Diabetes can be controlled by diet	17 (85%)	29 (83%)	13 (62%)	20 (67%)	75%
	Having a family member with diabetes, increase the risk of having diabetes in you	8 (40%)	22 (63%)	10 (48%)	8 (37%)	46%
Breast and Cervical cancers	Early detection of Breast and Cervical cancers have a better chance of becoming well again	12 (80%)	6 (55%)	12 (63%)	17 (74%)	69%

Annually there are about 12 million NCD deaths in the world due to unhealthy dietary habits and insufficient physical activity[2]. A study conducted in 2008 identified that among 13 – 15 year olds, 83% of males and 89% of females studied did not engage in adequate physical activities [2]. In the present study, almost 90% were aware that a

sedentary life style is a risk factor for NCDs; however, 35% were not aware about the time that should be spent for physical activities, while one fifth did not know exactly what activities are categorized under physical activities. The low physical activity rate in Sri Lankan school children maybe attributed to the time spent on television and tuition classes, and limited knowledge among parents about physical activities, as shown both in urban and rural settings in Sri Lanka [8,11].

In developing countries, the transition of healthy dietary patterns to unhealthy dietary patterns has led to the coexistence of overweight and obesity along with under nutrition[2]. Unhealthy dietary habits play a crucial role in the upsurge of NCD cases in Sri Lanka as well. A study conducted in Sri Lanka revealed that almost 70% of the study population exceeded the upper limit of the recommendations for starch intake[12] and more than 80% of the Sri Lankan adult population between the ages of 15 to 64 does not meet the recommended servings of fruits and vegetables. The recommended consumption of 5 portions of fruits and vegetables/day is practiced only by 3.5%[12]. Furthermore, Sri Lankans consume 9 times more saturated fats compared to polyunsaturated fatty acids (PUFAs)[13]. A recent research among adolescents of 17 years of age, in 65 schools, indicated that, nearly 82% of the adolescents consume sugar-sweetened soft drinks once weekly or more often, while 2% are daily consumers. Seventy-seven percent and 48% consumed sugar-sweetened carbonated drinks and sugar-sweetened fruit drinks once weekly or more often, respectively[14]. A majority of participants of this study (nearly 90%) were aware that unhealthy dietary habits is a risk factor for diabetes, but the knowledge on use of milk, fats and oils was not satisfactory. Furthermore, 13% did not know that junk food can cause NCDs. Yet, the knowledge of the present study sample is better compared to a study conducted in India, in which 11.2% and 5.2% of the population respectively had identified cigarette smoking/alcohol consumption and junk food as risk factors for NCDs[15].
According to a study conducted in India, almost one fifth of students at the age between 16-18 years knew that BMI is an indicator for obesity[16]. However, even in a rural area in Sri Lanka, 80% of the present study population knew BMI is an indicator for obesity. Of the population in the Indian study 47.4% and 27.6% knew that obesity and family history of diabetes are risk factors for diabetes respectively, compared to almost 80% and 46% of the present study, respectively. Alcohol misuse and a sedentary life style as risk factors were identified by only one tenth of the population in the study carried out in India, in contrast to the 86% and more than 90% who identified these risk factors respectively, in the present study. Another study conducted in India among adolescent school children in a rural area revealed that only 0.3% had a good level of knowledge regarding lifestyle risk factors, nearly 63% had no idea about the prevention of NCDs, and almost one third had a perception that non-communicable diseases were communicable in nature[17] while only 10% of the present study had this misperception. The knowledge on NCDs among adolescents in the Anuradhapura area in Sri Lanka was satisfactory, not only compared to other studies carried out in Asian countries, but even when compared to countries in other areas of the world[18].

Most educational training programs for adolescents on NCD prevention have elicited significant positive outcomes[19,20,15]. A report of the Population Reference Bureau in 2016 recommended that school-based nutrition, exercise, harmful substance education and intervention programs and media-based education and messaging via television, movies, and radio, as well as social media platforms, such as Facebook, Twitter, and YouTube as NCD preventive measures should be implemented to reduce the risk factors for NCDs[2].

Conclusions

The findings of this study indicate that the students who participated have a better knowledge on NCDs and NCD prevention compared to students from other South Asian countries. Students of the bio science stream had a better knowledge on certain areas of NCDs, compared to students in other three streams. However, despite these findings, local data suggests there is an increase in alcohol and tobacco use and low physical activity level among children in Sri Lanka. Therefore, it is important to implement programmes which could make a strong impact on students' attitudes and practices, to improve the practical application of their existing knowledge on NCD prevention.

Conflict of interest

Authors declare that they have no conflict of interest

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