Perspective

Access this article online
Website: www.searo.who.int/publications/journals/seajph
Quick Response Code:

Healthy Lifestyle Centres: a service for screening noncommunicable diseases through primary health-care institutions in Sri Lanka

DS Virginie Mallawaarachchi[1], Shiranee C Wickremasinghe[1], Lakshmi C Somatunga[1], Vithanage TSK Siriwardena[1], Nalika S Gunawardena[2]

ABSTRACT

The Ministry of Health in Sri Lanka initiated the Healthy Lifestyle Centres (HLCs) in 2011, to address the lack of a structured noncommunicable disease (NCD) screening service through the lowest level of primary health-care institutions. The main service objective of the HLCs is to reduce the risk of NCDs of 40–65 year olds by detecting risk factors early and improving access to specialized care for those with a higher risk of cardiovascular disease (CVD). The screened clients are managed at HLCs, based on the total-risk approach to assess their 10-year CVD risk, using the World Health Organization/International Society of Hypertension risk-prediction chart. Those with a 10-year CVD risk of more than 30% are referred to the specialized medical clinics, while others are managed with lifestyle modification and are requested to visit the HLC for rescreening, based on the levels of CVD risk and intermediate risk factors. Identified challenges to date include: underutilization of services, especially by men; weak staff adherence to protocols; lack of integration into pre-existing NCD-screening services; non-inclusion of screening for all the major NCDs; and human resources. The government plans to address these challenges as a priority, within the context of the *National multisectoral action plan for the prevention and control of NCDs in Sri Lanka 2016–2020*. Key interventions include: extended opening hours for HLCs, outreach activities in workplaces, and integration with "well woman clinics". Costs related to actions have been realistically estimated. Some actions have already been initiated, while others are being designed with identified funds.

Key words: cardiovascular disease, noncommunicable diseases, primary health care, screening, Sri Lanka

[1]Ministry of Health, Nutrition and Indigenous Medicine, Colombo, Sri Lanka, [2]World Health Organization Country Office, Colombo, Sri Lanka

Address for correspondence:
Dr DSV Mallawaarachchi, Noncommunicable Disease Unit, Ministry of Health, Nutrition and Indigenous Medicine, "Suwasiripaya", Baddegama Wimalawansa Thero Mawatha, Colombo 10, Sri Lanka
Email: ncdunit@gmail.com

BACKGROUND

The major noncommunicable diseases (NCDs), such as cardiovascular disease (CVD), cancer, chronic respiratory disease and diabetes, are the dominant health challenge of the 21st century and accounted for an estimated 63% of the global death toll in 2014. More than three quarters of these deaths occur in low- and middle-income countries.[1]

At present, NCDs are the leading causes of mortality, morbidity and disability in Sri Lanka. The government hospital data for 2012 show that approximately 65% of all deaths that year were due to NCDs.[2] The probability of dying between the ages of 30 and 70 years from the four main NCDs (CVD, cancer, chronic respiratory disease and diabetes) was 18%.[1]

SERVICES FOR NONCOMMUNICABLE DISEASES IN SRI LANKA

Sri Lanka offers free preventive, curative and rehabilitative health-care services through its public sector. The public health sector is organized in two streams: preventive services focusing mainly on promotive and preventive health, and curative services, which mainly focus on outpatient and inpatient care. The preventive health services are provided through 338 health units, known as medical officer of health (MOH) areas. The services are delivered by a team of field officers and led by a medical officer.

Curative institutions comprise an extensive network of institutions ranging from primary health-care (PHC)

institutions, namely primary medical care institutions (primary medical care units [PMCUs]) and divisional hospitals, to secondary and tertiary care institutions, with the National Hospital at the apex.

Responding to the increasing burden of chronic NCDs, in 1996, the preventive health services introduced screening for selected NCDs, exclusively for women, with the establishment of the "well woman clinics". These provide screening services for hypertension, diabetes mellitus and cancers of the breast and cervix, for women aged over 35 years. Utilization of these clinic services has been low, with some improvement over the past two decades.[3]

NCD care, provided through the curative-care service sector until 2010, was largely focused on managing patients diagnosed with NCDs at specialist clinics, as long-term outpatients and as inpatients in secondary- or tertiary-care institutions. The role of the PHC institutions was minimal, though some offered clinics to follow up long-term outpatients. However, as these institutions often lack the NCD medications and facilities to perform the necessary investigations, patients often bypassed these follow-up care services in PHC and used secondary and tertiary facilities. Although opportunistic screening by the medical officers of high-risk patients reporting to the institutions for other illnesses was encouraged, implementation of such screening was very low.

Acknowledging that prevention and control of NCDs is a priority in the country, the Government of Sri Lanka formulated the *National policy and strategic framework for prevention and control of chronic noncommunicable diseases* in 2010.[4] Guided by the World Health Organization (WHO) strategic framework of the *2008–2013 Action plan for the global strategy for the prevention and control of noncommunicable diseases*,[5] the objective of the Sri Lankan NCD policy is to reduce premature mortality due to chronic NCDs, through the expansion of evidence-based curative services and individual and community-wide health-promotion measures for the reduction of risk factors. The strategic framework includes nine strategies; one of these is implementing a cost-effective NCD screening programme at community level, with special emphasis on CVD.[4]

Guided by the worldwide evidence that implementation of universal, financially and physically accessible, high-quality clinical interventions to enhance early detection and treatment of NCDs through PHC is effective in reducing some NCD risk factors and preventing advanced-stage disease and complications at relatively low cost,[6,7] the Ministry of Health in Sri Lanka initiated the Healthy Lifestyle Centres (HLCs) in 2011, to address the lack of an NCD screening service provided through PHC institutions in Sri Lanka.

MODELS THAT CONTRIBUTED TO THE DEVELOPMENT OF THE HEALTHY LIFESTYLE CENTRES

For designing the HLCs, the Ministry of Health drew evidence from three pilot projects that had been conducted in Sri Lanka. The three models were the WHO *Package of essential noncommunicable (PEN) disease interventions for primary health care in low-resource settings* (WHO-PEN);[6] the NCD Prevention Project (NPP), piloted by the Japan International Cooperation Agency (JICA) (NPP-JICA);[8] and the community-based health-promotion component of the National Initiative to Reinforce and Organize General Diabetes Care in Sri Lanka (NIROGI Lanka) of the Sri Lanka Medical Association.[9]

The WHO-PEN is a set of interventions that defines the minimum standards to strengthen national capacity to integrate and scale up care of heart disease, stroke, CVD risk, diabetes, cancer, asthma and chronic obstructive pulmonary disease in primary health care in low-resource settings.[6] The core interventional activities of the WHO-PEN pilot project included protocols for screening and management of NCD, tools to predict the risk of CVD, essential medicines, essential technologies, standards and indicators to measure the progress of implementation, and the impact of the project and the information system on the services.[6] The basic details of the pilot project of the WHO-PEN in Sri Lanka and the key features relevant to the development of the HLC model are indicated in Table 1.

The *Project on health promotion and preventive care measures of chronic NCDs*, commonly identified as the NPP-JICA, was developed, tested and evaluated in two districts in Sri Lanka in 2008–2013.[8] The project comprised four models, namely a model for screening for major NCDs, a health-guidance model to guide people on healthy lifestyles, a model for health promotion to enable people to take control over and improve their health, and a social marketing model to disseminate information to prevent NCDs and enable individuals to gain access to services.[8] In the pilot project, the model for screening for major NCDs included testing the feasibility of different check-up models and a cost analysis.[8] Piloting allowed development of a final health check-up model, which has been included in NPP guidelines. The basic details of the pilot project of the NPP-JICA in Sri Lanka, and the key features relevant to the development of the HLC model, are indicated in Table 1.

The NIROGI Lanka project of the Sri Lanka Medical Association, supported by the World Diabetes Foundation, is an island-wide project comprising three components. The main component was a pilot on the feasibility of recruiting and training diabetes nurse educators, and strengthening primary health-care services to improve knowledge, skills and attitudes in the area of control and prevention of diabetes in Sri Lanka. One of the components, piloted in one MOH area in the district of Colombo, was on empowering communities from work, school and community groups through the activities that encourage community and family participation through a health-promotional approach.[9] Approaches used by the NIROGI Lanka project to address the risk behaviours of communities and families were incorporated into the HLC model (see Table 1).

Table 1. Key features of pilot projects on screening and managing noncommunicable diseases through primary health care conducted in Sri Lanka in relation to the Healthy Lifestyle Centres model

Pilot model	WHO-PEN[6]	NPP-JICA[8]	Sri Lanka Medical Association – NIROGI Lanka[9]
Dates of pilot	2009–2011	2008–2013	2009–2015
Location of pilot	1 district	2 districts	1 district
Number of facilities	3 MOH area	3 MOH areas	1 MOH area
Key features relevant to development of the HLC model	WHO/ISH chart for CVD risk prediction[10] Guideline for management of NCDs in primary health care, developed by the Ministry of Health, based on a total-risk approach, is being used to manage persons screened at HLCs[11] List of essential medicines proposed is being adapted and made available at primary health-care institutions to manage the screened persons being referred	Health check-up model used to recruit clients for the HLCs Health-guidance model is being used in managing the persons screened at HLCs Information system (registrant and returnees) is being used to document services provided at HLCs Health-education material developed in the social marketing model is being used in health-promotional education at HLCs	Approaches used to address the risk behaviours of communities and families

CVD: cardiovascular disease; HLC: Healthy Lifestyle Centre; ISH: International Society of Hypertension; MOH: medical officer of health; NCD: noncommunicable disease; NIROGI Lanka: National Initiative to Reinforce and Organize General Diabetes Care in Sri Lanka;[9] NPP-JICA: Noncommunicable disease Prevention Project, piloted by the Japan International Cooperation Agency;[8] WHO: World Health Organization; WHO-PEN: WHO *Package of essential noncommunicable (PEN) disease interventions for primary health care in low-resource settings*.[6]

HEALTHY LIFESTYLE CENTRES: THE SCREENING SERVICE FOR NONCOMMUNICABLE DISEASES THROUGH PRIMARY HEALTH-CARE INSTITUTIONS IN SRI LANKA

Establishment of HLCs by the Ministry of Health as an NCD screening service provided through PHC institutions dates back to 2011.[12] This initiative is in alignment with one of the strategies in the NCD policy of Sri Lanka on establishing cost-effective screening programmes for NCDs in Sri Lanka.[4] In accordance with the strategy, the focus of HLCs was proactive identification of both behavioural and intermediate risk factors, with a view to preventing the end-point of CVD, rather than treating patients. The main service objective of the HLCs is to reduce the risk of NCDs by detecting risk factors early and improving access to specialized care for those with NCDs.

PMCUs were the PHC institutions identified as the settings for the HLCs. The PHC institutions were expected to conduct HLCs on at least one weekday, from 08:00 to 12:00, with participation of a minimum of 20 clients. The population targeted for screening were individuals aged 40–65 years who were previously undiagnosed with major NCDs, which is nearly 25% of the total Sri Lankan population.[13] The PMCUs in Sri Lanka are the lowest level of curative institutions offering only outpatient services. They are staffed in most places with one medical officer and one health assistant and/or a dispenser. Supervision and coordination of the activities of HLCs at each district was assigned to a new cadre of medical officers, called medical officers (NCD) (MO(NCD)s), who are the coordinators for NCD-related activities at the district level.

The HLC model that is in place encourages the targeted population to use the HLC services through self-referral. Other methods used to enrol the targeted population are displaying banners and posters, referring from outpatient departments and giving health talks in the health institutions.

Activities at Healthy Lifestyle Centres

To ensure uniformity, services to be offered to the targeted population at HLCs are specified as protocols.

Screening for NCDs and risk factors

All users are issued a personal health record, specially designed for the HLC, which includes provision to record all the findings of the screening assessment and some educational messages on NCDs and risk factors. The screening services offered for intermediate risk factors for NCDs at HLCs investigate for fasting capillary blood glucose, blood pressure and body mass index. In addition, at the screening session, questions are also asked about behavioural risk factors such as smoking, alcohol consumption, unhealthy diet and physical inactivity. Facilities to test total cholesterol are not available in the HLCs at present.

Management of screened patients

The management of screened patients is prescribed in the publication of the Ministry of Health, *Guideline for management of NCDs in primary health care (total risk assessment approach)*.[11] All the screened clients are managed at HLCs, based on the total-risk approach assessing the 10-year CVD risk using the WHO/International Society of Hypertension (ISH) chart[10] adapted for Sri Lanka. Total cholesterol is one item on which information is required for this assessment and, as the facility to investigate total cholesterol is not available at HLCs at present, a proxy value of 5 mmol/L is used for clients.

At present, those with a 10-year CVD risk higher than 30% are referred to the specialized medical clinics conducted at the same PMCU or another institution, for further management. Given that the availability of medicine and technologies is vital to ensure a quality screening programme that provides the necessary interventions, a list of essential NCD drugs to be available at the PMCU has been developed. Furthermore, the Ministry of Health, Nutrition and Indigenous Medicine is taking the necessary steps to monitor and ensure the availability of essential drugs in all PMCUs throughout the year, which is one of the disbursement-linked indicators to measure progress of the health system in Sri Lanka. Those with a 10-year CVD risk below 30% are managed with lifestyle modification and are requested to visit the HLC based on the level of CVD risk and of intermediate risk factors. Group health-education sessions, using brochures, flip charts and videos designed and developed specifically to be used in HLCs, are done by staff trained for the purpose. Staff at HLCs are also encouraged to train the clients who attend the HLCs on physical activity.

Capacity-building of staff and strengthening of other services and resources

In parallel to the establishment of HLCs, island-wide training programmes were conducted in 2011–2012, to train the health-care staff of PHC institutions on following HLC protocols to implement the total-risk approach, recording information on personal medical records, and record keeping and data management. Following the initial training, MO(NCD)s were assigned to conduct in-service training for the relevant staff of HLCs, on an annual basis.

Information management system

The specifically designed paper-based information management system of the HLCs requires service-related data to be collated at each HLC, on a form specifically designed for this purpose, and to be returned to the MO(NCD) on a quarterly basis. The MO(NCD) of each district is required to collate the data and submit them to the NCD unit of the Ministry of Health, Nutrition and Indigenous Medicine.

Monitoring and evaluation of the services

The responsibility for monitoring and evaluation of the functions of the HLCs in the country lies with the Directorate of Noncommunicable Disease of the Ministry of Health, Nutrition and Indigenous Medicine, and regional directors of health services. At present, monitoring and evaluation of the functions of the HLCs is done at quarterly review meetings conducted at both national and district levels by the Directorate of Noncommunicable Disease and regional directors of health services.

TRENDS IN USE OF HEALTHY LIFESTYLE CENTRES

Since the initial directive from the Director-General of Health Services to initiate at least two clinics per MOH area incrementally in 2011,[12] the number of HLCs in the country has significantly increased (see Table 2). In addition, two of the disbursement-linked indicators for the Second Health Sector Development Project of the World Bank, initiated in 2013, are (i) the percentage of MOH areas with at least two HLCs and (ii) the percentage of persons aged over 40 years screened for selected NCDs at HLCs; this initiative has contributed immensely to expansion of the number and services of HLCs in the country.[14]

Table 2. The number and services of Healthy Lifestyle Centres in Sri Lanka, 2011–2016

	2011	2012	2013	2014	2015	2016 (first quarter)
Total number of HLCs	126	420	672	760	814	826
% of MOH areas in a district with two or more HLCs[a]	—	—	56.0 (187/334)	69.5 (235/338)	77.8 (263/338)	79.6 (269/338)
Cumulative % of the target population (aged 40–65 years) screened[b]	2.5	3.8	12.7	19.9	23.1	25.5
Ratio of men:women screened[a]	—	—	2.6:7.3	2.9:7.1	2.8:7.2	2.9:7.1

HLC: Healthy Lifestyle Centre; MOH: medical officer of health.

[a]Data not available for 2011 and 2012.

[b]Target population is nearly 25% of the country population.

Although the proportion of the targeted population screened in the country has increased almost tenfold from 2011 to 2016 (see Table 2), participation by men remains low, with no improvement. Table 3 presents an analysis of the routine data from the HLCs on the percentage of the targeted population in Sri Lanka found, over the period 2013–2015, to have behavioural or intermediate risk factors. This provides grounds for evaluating the HLC service in terms of its objective of detecting those with risk factors.

National data on the proportion of adults known to have specific NCDs or NCD-related risk conditions/behaviours, gathered through surveillance data in the country, can be considered as a benchmark to evaluate the success of the HLC services in terms of capturing the targeted population. However, direct comparison cannot be performed, as the WHO STEPwise approach to Surveillance (STEPS) survey studies adults aged 19–65 years, which includes people who are younger than the population targeted for HLCs.[15] The most recent island-wide STEPs survey for NCD risk factors conducted in Sri Lanka in 2007 was done in a representative sample of 12 500 adults aged 19–65 years.[16] If the HLC services were successful, one would expect that the proportion of the target population screened for behavioural and intermediate risk factors would reach the corresponding proportions from the STEPs surveys of 2007.

Comparison reveals that the proportion in the STEPs survey with high blood pressure (16.1%, 1883/11 710) and obesity (4.7%, 564/11 888) was lower than the proportion detected in the HLC population screened. Some other available indicators, namely the proportions of current tobacco smokers (15%, 1858/12 401) and current drinkers (13.5%, 1661/12 346) in the 2007 STEPs survey, were much higher than the proportions among those screened at HLCs. However, the low proportions of men using the clinics (see Table 3) will have contributed to the picture of the risk factors for alcohol consumption and smoking.

Furthermore, routine data from HLCs facilitates identification of districts or provinces that need to be focused for attention in prevention and control of NCDs. For example, the most recent data indicate that the districts of Nuwaraeliya and Killinochchi have particularly high prevalences of risk factors and behaviours among those screened at HLCs and so they will receive more targeted interventions.

CHALLENGES TO ACHIEVING THE OBJECTIVES OF THE HEALTHY LIFESTYLE CENTRE MODEL

A range of monitoring and evaluation activities – including critical review of the analysis of routine data of HLCs, facility and client surveys, field supervision visits, and regular review meetings of HLC staff and MO(NCDs) – have resulted in identification of the following challenges to achieving the objectives of the present model of HLCs.

First, underutilization of the HLC services by the target population is a key challenge. The HLC services not being "well known" to the public, and the attitude of being "healthy and not requiring screening tests" among those who have been educated on the service, have been cited as the reasons. This underutilization is especially prevalent among men and has been attributed to men being mostly employed and at work during the HLC clinic sessions, which are confined to weekdays between 08:00 and 12:00.

Table 3. Numbers and proportions of targeted population screened in Sri Lanka with behavioural or intermediate risk factors, 2013–2015

Behavioural or intermediate risk factor	Number (%) of screened population with risk factor		
	2013[a]	2014[b]	2015[c]
Fasting blood glucose >126 mg/dL	37 980 (11.58)	48 853 (12.75)	41 372 (10.57)
Raised blood pressure (systolic ≥140 mmHg and/or diastolic ≥90 mmHg)	69 400 (21.16)	91805 (23.96)	89 862 (22.97)
Overweight (BMI ≥25 kg/m^2)	90 686 (27.65)	100 618 (26.26)	99 873 (25.53)
Obese (BMI ≥30 kg/m^2)	29 255 (8.92)	29 043 (7.58)	32 300 (8.26)
Current tobacco smoker	18 170 (5.54)	25 557 (6.67)	26 826 (6.86)
Current drinker	40 604 (12.38)	28 775 (7.51)	29 836 (7.63)
Smokeless tobacco user	21 089 (6.43)	53 604 (13.99)	53 651 (13.71)
With 10-year CVD risk ≥30%	1 836 (0.56)	1 724 (0.45)	2 268 (0.58)

BMI: body mass index; CVD: cardiovascular disease.

[a]88 554 men screened; 239 425 women screened; total population screened: 327 979.

[b]110 469 men screened; 272 692 women screened; total population screened: 383 161.

[c]108 399 men screened; 282 861 women screened; total population screened: 391 260 (weighted data).

Second, there are weaknesses in the services provided at HLCs. For example, practical sessions on lifestyle-changing interventions are currently inadequate and limited to health-education sessions, although a few HLCs conduct regular physical exercise sessions for registrants. In addition, surveys and field-supervision sessions have indicated that adherence to the HLC protocols by the HLC service providers is variable. Non-use of the total-risk approach for CVD in managing the screened persons is the most common variation that has been highlighted. Services for screening of breast cancer and cervical cancer are still delivered through "well woman clinics" and at present have not been linked to HLC services. In addition, although the design of HLCs includes screening for chronic respiratory diseases using peak-flow meters, this is not being done at present. The reasons cited by staff range from technical difficulties in getting the personnel to perform the test to non-availability of disposable mouth pieces.

The third key challenge is lack of a registrant follow-up system and insufficient human resources. There is no system to track the clients who do not return for HLC screening following their initial screening. The lack of a back-referral system precludes an ability of HLCs to monitor whether clients identified as at high CVD risk have gone on to access the services to which they were referred. PMCUs, where the HLCs are mainly based, function with limited health staff of all categories. No additional staff have been provided to the institutions to conduct the HLC clinics.

Finally, an absence of grass-roots-level fieldworkers dedicated to NCD-related work in the country has limited the capacity of the health system to encourage the targeted population to use the HLCs and to follow up the HLC users in the community to continue lifestyle-promotional activities.

THE WAY FORWARD IN STRENGTHENING THE HEALTHY LIFESTYLE CENTRES PROGRAMME

To address the challenges, the Government of Sri Lanka recently launched the *National multisectoral action plan for the prevention and control of NCDs in Sri Lanka 2016–2020*;[17] the actions required to respond to the challenges faced by HLCs have been prioritized for the first two years, 2016–2017.[17] The costs related to actions have been realistically estimated. Some actions have already been initiated, while others are being designed with identified funds. The key remedial measures are discussed next.

In order to facilitate screening of the target population and to increase male participation in the screening, plans are under way to extend the routine HLC opening hours of 08:00 to 12:00 until late evenings at 18:00. The additional funds required for payment of extra duty hours to the staff have been accounted for in the costing of the plan. The feasibility of extending the opening hours of HLCs to weekends and public holidays is currently under discussion. Conducting the NCD screening service as an "outreach" screening programme in geographical locations where participation is low, and in workplace settings, has also been initiated.

Ethnographic research is planned, to give a better understanding of human behaviour in relation to undergoing screening tests. It is hoped this will generate evidence on motivating the apparently healthy to undergo screening. Mass-media campaigns have been proven to be effective in making the public aware of the health services in the country, and plans are under way to advertise the services of HLCs through a social marketing campaign.

Measures are also under way to include screening for breast and cervical cancer, which are typically offered at "well woman clinics", in the services of HLCs. Similarly, incorporation of CVD screening into the "well woman clinics" is being considered. Screening for oral cancer by visual inspection, and for asthma using a validated questionnaire, is also going to be incorporated to the services of HLCs.

The following measures are also being implemented to improve utilization of HLC protocols for screening and managing clients:

- use of random blood glucose values instead of fasting blood glucose to calculate total CVD risk and facilitate the assessment of total CVD risk of the many individuals who attend without fasting;
- inclusion of facilities at the HLCs to test for total cholesterol, to allow use of the actual value instead of the arbitrary figure used in current practice, in order to improve the accuracy of assessment of total CVD risk;
- lowering of the threshold at which the treatment of CVD is to be initiated, from 30% to 20% 10-year risk.

The necessary steps have been taken to convert the HLC information system to an electronic system that feeds in data at the district level. This will enable staff to cross-check the data, thereby improving its quality, and will also assist them in identification of service deficiencies.

Finally, discussions have been initiated to develop a separate cadre for a grass-roots-level fieldworker dedicated to NCD-related work in the country, in order to improve the capacity of the health system to encourage the targeted population to use the HLCs, and to follow up the HLC users in the community to encourage them to continue activities that promote a healthy lifestyle.

REFERENCES

1. Global status report on noncommunicable diseases 2014. Geneva: World Health Organization; 2014 (http://apps.who.int/iris/bitstream/10665/148114/1/9789241564854_eng.pdf?ua=1, accessed 19 July 2016).
2. Annual Health Bulletin 2012 Sri Lanka. Colombo: Medical Statistics Unit Ministry of Health; 2012 (http://www.health.gov.lk/en/publication/AHB-2012/Annual%20Health%20Bulletin%20-%202012.pdf, accessed 9 July 2016).
3. Annual report of the Family Health Bureau Sri Lanka 2006–2007. Colombo: Family Health Bureau; 2009.
4. Ministry of Health. The national policy and strategic framework for prevention and control of chronic noncommunicable diseases. Colombo: Ministry of Health; 2009 (http://health.gov.lk/en/NCD/temp/NCD%20Policy%20English.pdf, accessed 9 July 2016).
5. 2008–2013 Action plan for the global strategy for the prevention and control of noncommunicable diseases. Geneva: World Health Organization; 2009 (http://www.who.int/nmh/publications/ncd_action_plan_en.pdf, accessed 9 July 2016).

6. Package of essential noncommunicable (PEN) disease interventions for primary health care in low-resource settings. Geneva: World Health Organization; 2010 (http://www.who.int/nmh/publications/essential_ncd_interventions_lr_settings.pdf, accessed 9 July 2016).
7. Mendis S, Al Bashir I, Dissanayake L, Varghese C, Fadhil I, Marhe E et al. Gaps in capacity in primary care in low-resource settings for implementation of essential noncommunicable disease interventions. Int J Hypertens. 2012;2012:584041. doi:10.1155/2012/584041.
8. Ministry of Health, Japan International Cooperation Agency. Project on health promotion and preventive care measures of chronic NCDs. Final Report. Colombo: Ministry of Health; 2013 (http://open_jicareport.jica.go.jp/pdf/12112322.pdf, accessed 9 July 2016).
9. Wijeyaratne C, Arambepola C, Karunapema P, Periyasamy K, Hemachandra N, Ponnamperuma G et al. Capacity-building of the allied health workforce to prevent and control diabetes: lessons learnt from the National Initiative to Reinforce and Organize General Diabetes Care in Sri Lanka (NIROGI) Lanka project. WHO South-East Asia J Public Health. 2016;5(1):34–9.
10. WHO/ISH risk prediction charts for 14 WHO epidemiological sub-regions. Geneva: World Health Organization/International Society of Hypertension; 2007 (http://ish-world.com/downloads/activities/colour_charts_24_Aug_07.pdf, accessed 9 July 2016).
11. Guideline for management of NCDs in primary health care (total risk assessment approach). Colombo: Ministry of Health; 2012.
12. General Circular NCD/41/2011. Guidelines for the establishment of healthy life style centres (HLCs) in health care institutions. Colombo: Ministry of Health; 2011.
13. Department of Census and Statistics – Sri Lanka. Census of Population and Housing 2012 (http://www.statistics.gov.lk/page.asp?page=Population and Housing, accessed 9 July 2016).
14. Progress report of the Second Health Sector Development Project of Sri Lanka. Colombo: Ministry of Health; 2014
15. World Health Organization. Chronic diseases and health promotion. STEPwise approach to chronic disease risk factor surveillance (http://www.who.int/chp/steps/sri_lanka/en/, accessed 9 July 2016).
16. National noncommunicable disease risk factor survey 2007. Colombo: Ministry of Health; 2007.
17. National multisectoral action plan for the prevention and control of NCDs in Sri Lanka 2016–2020 (http://www.searo.who.int/srilanka/documents/national_ncd_action_plan_sri_lanka.pdf?ua=1, accessed 9 July 2016).

How to cite this article: Mallawaarachchi DSV, Wickramasinghe SC, Somatunga LC, Siriwardana VTSK, Gunawardana NS. Healthy Lifestyle Centres: a service for screening noncommunicable diseases through primary health-care institutions in Sri Lanka. WHO South-East Asia J Public Health 2016; 5(2): 89–95.

Source of Support: Nil. **Conflict of Interest:** DSVM, SCW, LCS and VTSKS are attached to the Ministry of Health, Nutrition and Indigenous Medicine, Sri Lanka, the Noncommunicable Disease Unit of which is the national focal point for implementing, monitoring and evaluating the services of the Healthy Lifestyle Centres. **Authorship:** DSVM was responsible for conceptualizing the article, analysing data and writing and revising the manuscript; SCW, LCS and VTSKS were responsible for conceptualizing and drafting the article; NSG was responsible for analysing data and writing and revising the manuscript.