

**10<sup>th</sup> MALAYSIA STATISTICS CONFERENCE 2023**  
**Looking Beyond GDP: Toward Sosial Well-being and Environmental Sustainability**

26<sup>th</sup> September 2023  
Sasana Kijang, Bank Negara Malaysia

**Sub-theme**

**Malaysian Healthy Lifestyle Index**

Khairulnissa Abdul Kadir<sup>1</sup>, Logeswary Krisnan<sup>1</sup>, Saiful Adli Suhaimi<sup>1</sup>, Normawati Ahmad<sup>1</sup>, Wan Nurul Izza Wan Husin<sup>2</sup>, Manimaran Krishnan<sup>1</sup>, Nur Aina Syazwani Zakaria<sup>1</sup>

- 1 Institute for Health Behavioural Research, Ministry of Health, Malaysia
- 2 Faculty of Human Development, Universiti Pendidikan Sultan Idris, Malaysia

**Abstract:**

An evaluation instrument called the Malaysian Healthy Lifestyle Index was created to measure and evaluate people's overall health behaviors and lifestyle decisions in Malaysia. incorporating a variety of markers, such as healthy eating, physical activity, healthy without smoking, and mental well-being. The index is intended to provide a thorough reference for actions and choices related to public health in combating non-communicable diseases. Overall, healthy lifestyle index could serve as a means to assess and track the healthy lifestyle habits within society. Furthermore, it can assist in identifying areas that require improvement and setting achievable goals to enhance these health-conscious behaviors. Additionally, the index could serve as a valuable resource for public health guidance to individuals, enlightening them about the positive outcomes of adhering to these recommendations to lower the susceptibility to particular illnesses. By possessing precise data on lifestyle patterns, it becomes feasible to conduct disease management and primary as well as secondary prevention, ultimately reducing the future occurrence of non-communicable diseases.

**Keywords:**

Healthy lifestyle index; physical activity; non-communicable disease; behaviour; mental health

**1. Introduction:**

Given the worrisome rise in NCD rates in Malaysia over the past several decades since 1996 (Harris et al., 2019), it's critical to comprehend how vital health behaviors and practices are changing. Lifestyle diseases are different from other diseases because these are potentially preventable, and can be lowered with changes in diet, lifestyle, and environment. In particular, an unhealthy and irregular life pattern may increase the risk of lifestyle diseases in the later part of life (Girko, 2001). If the diseases are identified at an early stage, the rate of death can be decreased, avoided, or prevented with the recommended lifestyle and treatments (Narayan & Sathiyamoorthy, 2019). A study from the United States indicated that adults with unhealthy lifestyles who subsequently adopted healthier lifestyles had a 35% lower risk of cardiovascular disease and a 40% lower risk of all-cause mortality over four years compared to those who maintained unhealthy lifestyles (Hulsegege et al., 2016). A combination of active lifestyle changes such as being physically active, avoiding smoking and alcohol intake, good mental and

eating behaviours, and modification of psychosocial and behavioural factors is likely to reduce health problems and curtail declines associated with physical inactivity.

Additionally, a system of evaluation is needed to measure the possibilities for healthy living. As a result, we suggested developing the Malaysian Healthy Lifestyle Index (MHLI). The MHLI's objective is to offer Malaysians a simple health assessment tool that enables people to quantify their current health behaviors and, in turn, empowers them to make positive adjustments in their health behaviors to lead healthier lifestyles. Previous research has demonstrated a strong correlation between the Healthy Lifestyle Index (HLI) and the prevalence and incidence of NCDs. Additionally, it has been demonstrated that maintaining multiple lifestyle habits—including those related to alcohol, physical activity, diet quality, and BMI—would have a greater synergistic effect than maintaining just one of them (Díaz-Gutiérrez et al., 2018).

## 2. Methodology:

There will be two stages to this study, consisting the first phase where The Malaysian Healthy Lifestyle Index tool was developed and validated. The second phase uses a cross-sectional quantitative study where the baseline study on the Health Lifestyle Index evaluation among Malaysians using the validated instrument.

### 2.1 Stage 1 of Development of the Index

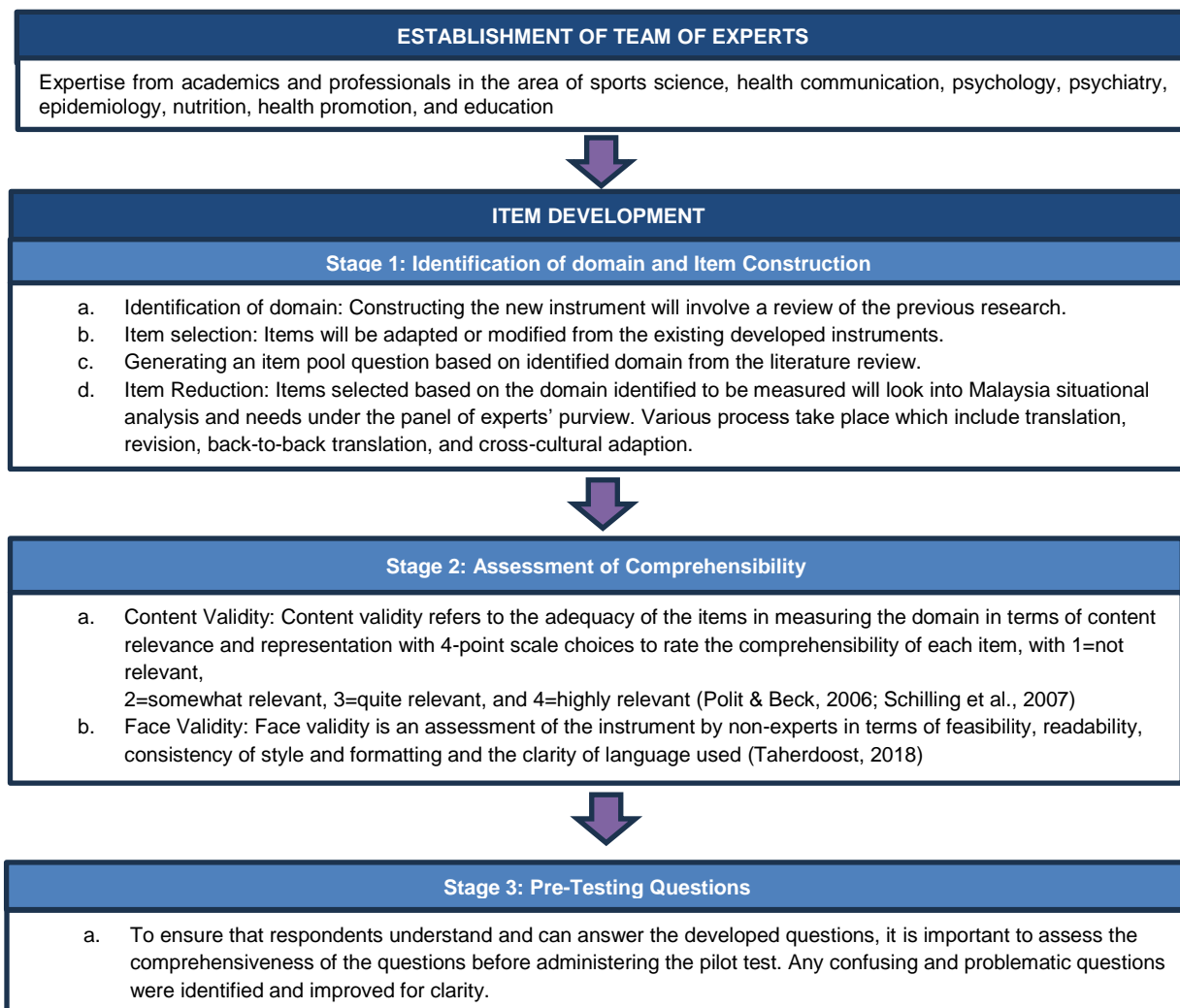


Figure 1.1: Steps of instrument development

## 2.2 Second Stage: Data Collection of the Index

The second phase of the study will focus on the baseline study of the Healthy Lifestyle Index assessment among Malaysians using the validated instrument using a cross-sectional approach. The data collection using quantitative methods through survey questionnaires.

## 2.3 Study Population

This study involves Malaysian citizens from the whole of Malaysia aged 18 and above.

## 2.4 Sampling

The sample size calculation is based on (Naing et al., 2006). Based on the NHMS 2015 & 2019, the sample size is calculated based on a variance of the proportion of the variable of interest (previous data from NHMS on mental health among adults, current tobacco use, dietary practices, physical activity, current alcohol use, and health literacy). Taking into consideration non-response, the sample size calculated for adults will be 9,200 participants (with a 35% non-response rate).

## 2.5 Research Instrument

The MHLI was used as a valid measurement for assessing the Malaysian Healthy Lifestyle Index (provided the Cronbach's alpha value of the instruments in Table 1.1).

Table 1.1: Cronbach's alpha for each factor

Variables	Sub-dimension	Number of Items (n)	Cronbach's alpha (Pre-test)
Health literacy related to healthy lifestyle	Seeking health information	18 items	0.98
	Understanding the information		
	Evaluate the information		
	Judging the information		
	Making decision		
Physical activity	Act upon the decision	6 items	0.53
	Willingness to spend money for physical activity		
	Will to get active		
Healthy eating	Usage of medium for physical activity	17 items	0.83
	Volunteerism		
	Portion of food intake		
	Taking of fried foods		
Healthy eating	Taking of sweet foods and beverages	5 items*	0.70
	Drinking of plain water		
Healthy without smoking	Taking processed food	6 items	0.87
	Supportive environment		
	Healthy living culture without smoking		
Mental health	Healthy living culture without alcohol	4 items	0.72
	Psychological health	4 items	0.92
	High-risk behavior	9 items	0.76
	Social well-being	3 items	0.70
	Supportive environment	7 items	0.79
	Healthy living culture with good mental health	7 items	0.91
	Spiritual well-being		

## 2.6 Data analysis

Minimum and maximum values are set in order to transform the indicators expressed in different units into indices between 0 and 1. Assuming the indicator scores across all four domains are equal in weight based on literature and experts, the score for each domain is derived (Livingstone & McNaughton, 2017; Villegas et al., 2008). Refer to

Table 1.2, the score for each domain is obtained by summing the indicator scores in all four domains with considering all are the same in weightage based on literature (Livingstone & McNaughton, 2017; Villegas et al., 2008). The MHLI was further transformed to the categorical variable: very low in healthy lifestyle practise (below .34), Low in healthy lifestyle practice (score .35 - .44), moderate healthy in lifestyle practice (score .45-.54) and excellent healthy lifestyle practises (.55 and above)

Table 1.2: Calculating Healthy Lifestyle Index

Calculating Healthy Lifestyle Index	
Step 1	Having defined the minimum and maximum values, the dimension indices are calculated as:  $\text{Dimension index} = \frac{\text{actual value} - \text{minimum value}}{\text{maximum value} - \text{minimum value}}$
Step 2	Each dimension index is a proxy for capabilities in the corresponding dimensions Aggregating the dimensional indices  The HLI is the geometric mean of the four-dimensional indices:  $\text{HLI} = ( \text{Physical activity} \times   \text{Mental health} \times   \text{Healthy eating} \times   \text{Healthy without smoking} )^{1/4}$

### 3. Result:

The Malaysian Healthy Lifestyle Index score uses a range of 0 to 1, i.e. a score of 1 is a score maximum. The higher the percentage value obtained, the better the level of the healthy lifestyle index of the respondents. The score for each lifestyle factor was defined as follows: Physical activity (minimally active to active HEPA), healthy eating (0= unhealthy, 7=healthy eating), smoking (1= non-smoker, 0=smoker), mental health (0= less healthy, 90 healthy).

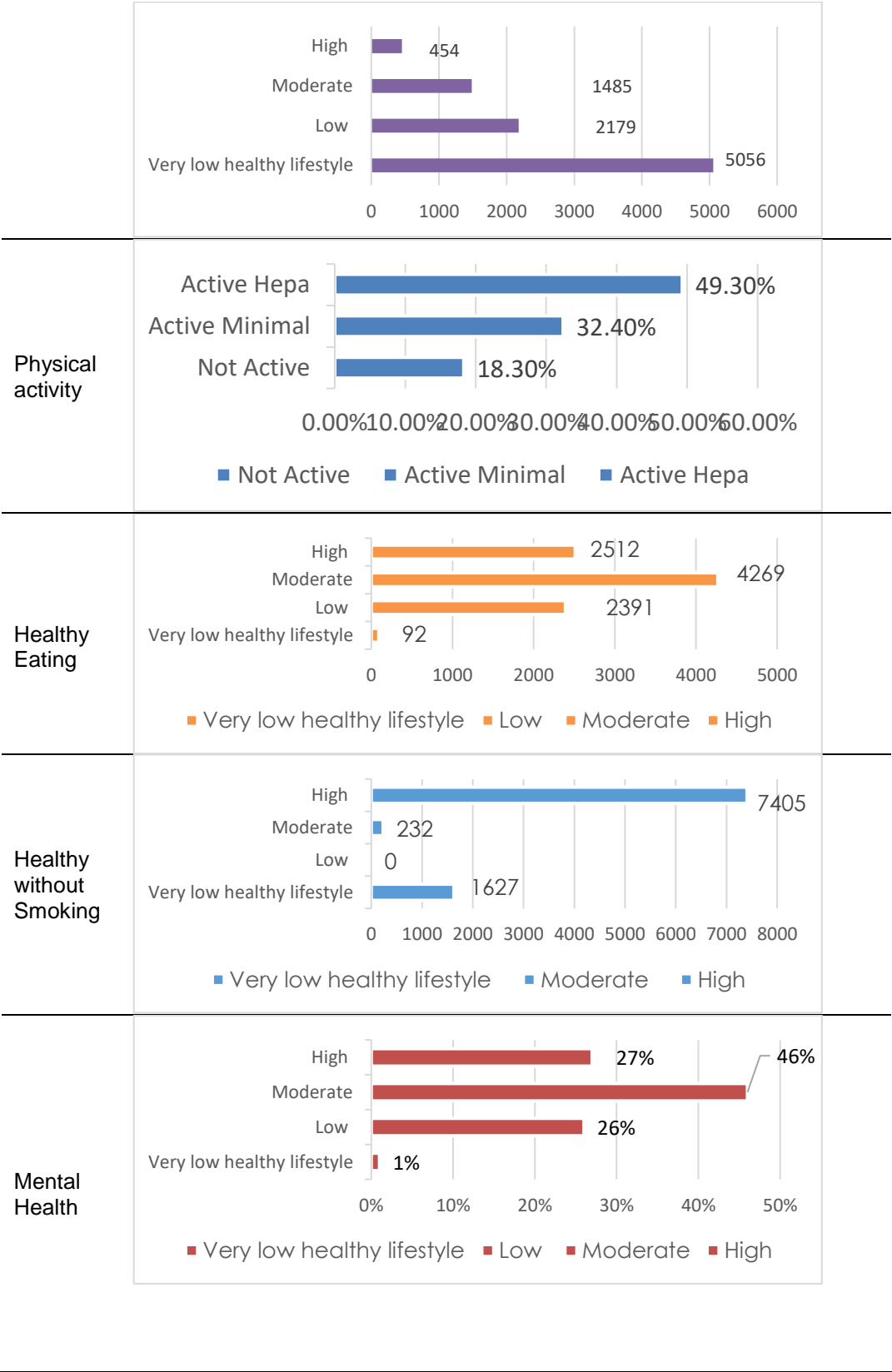
The index score is obtained by summing the scores for each domain along with its weights(weightage). The score for each domain is obtained by summing the indicator scores in all four domains with considering all are the same in weightage based on literature

(Livingstone & McNaughton, 2017; Villegas et al., 2008). The MHLI was further transformed to the categorical variable: very low in healthy lifestyle practise (below .34), Low in healthy lifestyle practice (score .35 - .44), moderately healthy in lifestyle practice (score .45-.54) and excellent healthy lifestyle practises (.55 and above).

The overall index revealed that Malaysian has a very low healthy lifestyle, despite having high to moderate score for each domain. The results also revealed that the majority of respondents (55%) had very low scores on the healthy lifestyle index, while only 5% had high scores and 16% had moderate scores. There is evidence from numerous studies that the healthy lifestyle index and health conditions like hypertension are related. In Sri Lanka, individuals with low HLI scores are significantly associated with lower rates of hypertension among community adults (Fukunaga et al., 2020).

Table 1.3. Overall Malaysian Healthy Lifestyle Index Comprising Physical Activity, Healthy Eating, Healthy Without Smoking and Mental Health

Index	Results
Overall	



**4. Discussion and Conclusion:**

The MHLI's purpose is to give Malaysians access to an easy-to-use instrument for assessing health behaviour that allows people to quantify their current health behaviour and, in doing so, empowers them to adopt healthy lifestyle adjustments. Behavioural risk factors, including physical inactivity, unhealthy diet, smoking, mental health, and unhealthy alcohol use are among the main factors leading to non-communicable diseases (NCDs). While for the policy maker, this index can be used as a mechanism

to gauge and monitor society's healthy lifestyle behaviour. Tools for community-based prevention efforts to draw attention to opportunities for healthy living and create impetus for individual/community changes (Kim et al., 2004). This index can aid in identifying areas for development and establishing reasonable targets for increasing healthy lifestyle behaviour.

## References:

- Díaz-Gutiérrez, J., Ruiz-Canela, M., Gea, A., Fernández-Montero, A., & Martínez-González, M. Á. (2018). Association Between a Healthy Lifestyle Score and the Risk of Cardiovascular Disease in the SUN Cohort. *Revista Española de Cardiología (English Edition)*, 71(12), 1001–1009. <https://doi.org/10.1016/j.rec.2017.10.038>
- Fukunaga, A., Inoue, Y., Chandraratne, N., Yamaguchi, M., Kuwahara, K., Indrawansa, S., Gunawardena, N., Mizoue, T., & Samarasinghe, D. (2020). Healthy lifestyle index and its association with hypertension among community adults in Sri Lanka: A cross-sectional study. *PLoS ONE*, 15(1), 1–9. <https://doi.org/10.1371/journal.pone.0226773>
- Girko, V. L. (2001). Ten Years of Life: is it a matter of choice? *Archives of Internal Medicine*, 161(13), 1645–1652. <https://doi.org/10.1001/archinte.161.13.1645>
- Harris, H., Ooi, Y. B. H., Lee, J. S., & Matanjun, P. (2019). Non-communicable diseases among low income adults in rural coastal communities in Eastern Sabah, Malaysia. *BMC Public Health*, 19(Suppl 4), 1–13. <https://doi.org/10.1186/s12889-019-6854-6>
- Hulsegge, G., Looman, M., Smit, H. A., Daviglius, M. L., van der Schouw, Y. T., & Monique Verschuren, W. M. (2016). Lifestyle changes in young adulthood and middle age and risk of cardiovascular disease and all-cause mortality: The doetinchem cohort study. *Journal of the American Heart Association*, 5(1), 1–11. <https://doi.org/10.1161/JAHA.115.002432>
- Kim, S., Popkin, B. M., Siega-Riz, A. M., Haines, P. S., & Arab, L. (2004). A cross-national comparison of lifestyle between China and the United States, using a comprehensive cross-national measurement tool of the healthfulness of lifestyles: The Lifestyle Index. *Preventive Medicine*, 38(2), 160–171. <https://doi.org/10.1016/j.ypmed.2003.09.028>
- Livingstone, K. M., & McNaughton, S. A. (2017). A Health Behavior Score is Associated with Hypertension and Obesity Among Australian Adults. *Obesity*, 25(9), 1610–1617. <https://doi.org/10.1002/oby.21911>
- Naing, L., Winn, T., & Rusli, B. N. (2006). Practical Issues in Calculating the Sample Size for Prevalence Studies. *Archives of Orofacial Sciences*, 1(January), 9–14.
- Narayan, S., & Sathiyamoorthy, E. (2019). A novel recommender system based on FFT with machine learning for predicting and identifying heart diseases. *Neural Computing and Applications*, 31, 93–102. <https://doi.org/10.1007/s00521-018-3662-3>
- Polit, D. ., & Beck, C. T. (2006). The Content Validity Index: Are You Sure You Know What's Being Reported? Critique and Recommendations. *Research in Nursing & Health*, 29, 489–497.
- Schilling, E. A., Aseltine, R. H., & Gore, S. (2007). Adverse childhood experiences and mental health in young adults: A longitudinal survey. *BMC Public Health*, 7, 1–10. <https://doi.org/10.1186/1471-2458-7-30>
- Taherdoost, H. (2018). Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. *SSRN Electronic Journal*, 5(3), 28–36. <https://doi.org/10.2139/ssrn.3205040>
- Villegas, R., Kearney, P. M., & Perry, I. J. (2008). The cumulative effect of core lifestyle behaviours on the prevalence of hypertension and dyslipidemia. *BMC Public Health*, 8, 1–7. <https://doi.org/10.1186/1471-2458-8-210>

**NOTE: THE REQUIRED NUMBER OF PAGES FOR PAPER IS SIX PAGES**