Health and Physical Activity in Urban Neighbourhoods. Case Study: Shah Alam City, Selangor, Malaysia

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ABSTRACT

Environmental health is referring to the health of people in relation to environmental quality. Due to rapid urbanisation, more people are living in urban neighbourhoods. Urban planning and design aspects including the neighbourhood environment are potentially affecting the human healthy lifestyle and health condition. Thus, the relationship between Malaysian neighbourhood environmental aspects and human health has become the concern of this research. One of the neighbourhood units in Shah Alam city had been chosen as the study area for this purpose. Questionnaire survey had been carried out to examine the health condition and physical activeness of residents. Besides, the perception of residents on the quality of neighbourhood environmental aspects also had been collected in the questionnaire survey. The health condition of residents was measured by non-communicable diseases (NCD) and the physical activeness was measured in duration as well as the frequency of physical exercise activities. The study found that the quality of neighbourhood environmental aspects significantly increased the physical activeness of respondents. The physical activeness was positively associated with human health as measured in NCD (heart diseases and high blood pressure, HBP). It shows that neighbourhood environmental (physical and social) aspects are potentially affecting the healthy life of people living in the neighbourhood.

Keywords: *Healthy life, Neighbourhood environment, Non-communicable diseases (NCD), Physical activeness, Quality.*

INTRODUCTION

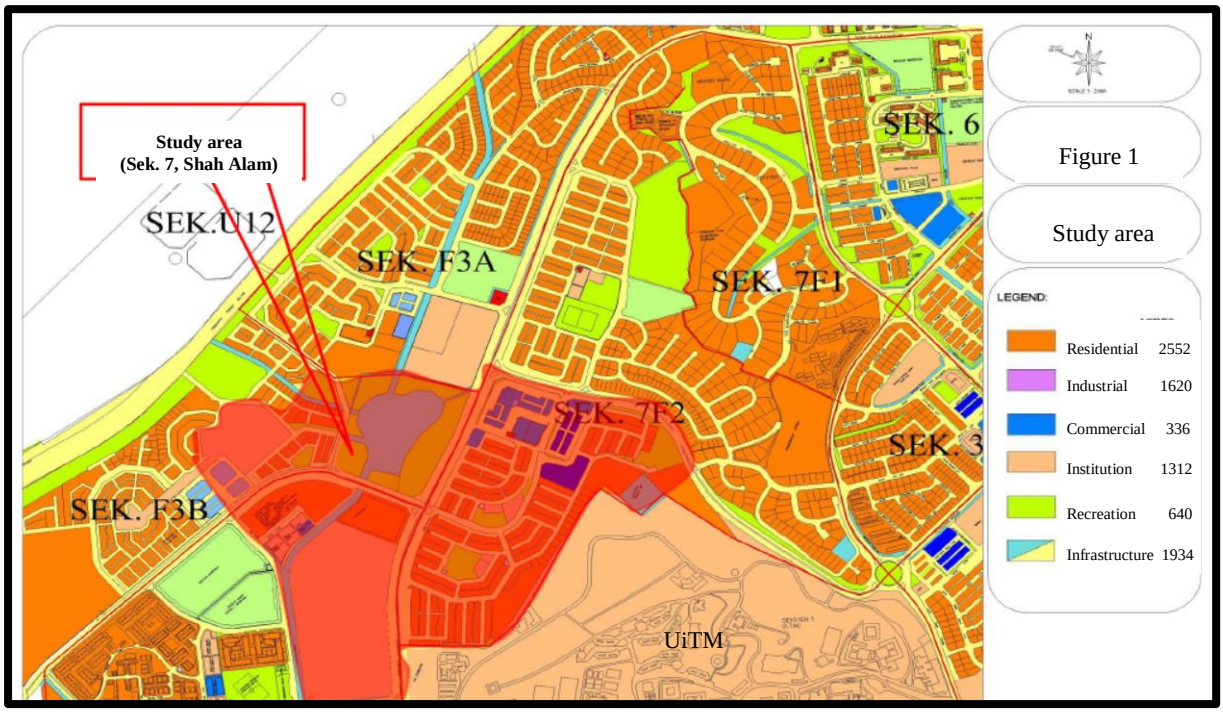
Environmental health is referring to human health and the relationship with environmental aspects. It can be related to the theory, knowledge and practice of assessing and controlling factors in the environment that are potentially affecting human health (WHO, 2007). As stated by WHO (1992), a healthy environment is not only a needs; it is also a human right. It is the right to live and work in an environment conducive to human (physical and mental) health.

Due to the high urbanisation rate including in Malaysia, the concern of a healthy environment should be more focus on the urban settlements (Siti Nur Afiqah et al., 2015). In 2000, almost half of the world population (46.6%) lived in urban areas, which was 2.85 billion. The urban population was

projected to increase to 4.97 billion by 2030, which is 59.7% of the world's population (UN, 2008). Due to the urbanisation process, urban areas are under high development pressure. It is due to the in-migration of the population in urban areas (Siti Nur Afiqah et al., 2015). With the high rate of in-migration, urban areas are pressured to provide more dwelling units, retail lots and public facilities, more highways to accommodate the high traffic volume, and more waste management or disposal facilities for the waste (including solid waste and wastewater). Urban areas are associated with the issue of a healthy environment. In term of the environment, the air is being polluted (Nurul Ashikin et al., 2015). For instance, there was a clear increasing trend in the number of unhealthy or hazardous days (as measured in Air Pollution Index), which increased from 11 days in 2001 to 67 days in 2005 in Kuala Lumpur city (Ling et al., 2012). Another study showed that urban areas with more industrial areas *i.e.* Shah Alam and Klang were more polluted (unhealthy as measured in air pollution index) as compared to Petaling Jaya with less industrial areas (Nurul Ashikin et al., 2018; Ling et al., 2014).

This study aims to identify the cause and effect of the relationship of human health with the level of physical activities and urban neighbourhood environment. Non-communicable diseases (NCD) *i.e.* heart disease and high blood pressure had been used to indicate the condition of human health. It is related to the level of physical activeness as measured in duration and frequency of physical exercise/sports activities. The perception of respondents on the quality of the neighbourhood environment were tested against the level of physical activeness. The data were analysed using Frequency, Cross-tabulation and Correlation tests as available in Statistical Package for Social Science (SPSS) software.

Section 7, Shah Alam City (Figure 1) was chosen as the study area for this preliminary study. Shah Alam city is the capital of Selangor state, Malaysia. The city is located adjacent to the Klang town and Petaling Jaya City. It is located about 25 km to the west of Kuala Lumpur City. The population of Shah Alam in the year 2010 are 443,222 people (DOS, 2011).



HUMAN HEALTH, PHYSICAL ACTIVITIES AND URBAN ENVIRONMENT

Jackson and Kochtitzky (no date) argued that urban land use structure and settings, transportation systems, housing characteristics, and architectural or urban design are potentially affecting human health. For example, human experiences were changed as people spent long periods every day on the vehicles for working purpose, reduced frequency and duration of exercise (physical activity) and suffered higher levels of stress than they did in the past (Siti Nur Afiqah et al., 2015). Furthermore, some of the aspects of urban environment discourage active living include a lack of quality lighting; a lack of access to open spaces and recreation facilities; and low quality of built environment (Edwards and Tsouros, 2006).

Studies (Edwards and Tsouros, 2006) showed that healthy diet and adequate physical activity (*i.e.* at least 30 minutes of moderate-intensity exercise, with at least 5 days a week) give a positive impact in the prevention of the NCD. The five major NCDs are the cardiovascular disease (CVD) or heart disease, stroke, cancer, chronic respiratory diseases and diabetes (Siti Nur Afiqah et al., 2015). In 2005, NCD accounted for 60% of all projected deaths worldwide, which were approximately 35 million people died due to NCD (WHO, 2008b).

Based on previous research, human health and well-being, especially for the children are potential to be improved by contact with the natural area and outdoor activity/exercise (Charles, 2012). Thus, one of the important contributions of environmental quality to human health and well-being lies in the availability of safe resources (*e.g.* food and water supply) and a safe/good environment (indoor and outdoor) for living, working, leisure and social within an area that human can thrive (Parkets et al., 2003; Marlyana Azyyati et al., 2020). Besides, studies (Doran et al., 2013) also shown that the potential effects of "social determinants" such as safe housing, healthful food, and opportunities for education and employment on human health. Experts estimate that medical care only contributes to 10% of overall health, whereby, social, environmental, and behavioural factors contribute 90% of overall health factors.

Globally, research has been carried out about the urban or neighbourhood development, physical activeness and human health or well-being (Khan, 2012; Richardson et al., 2013; Raerino et al., 2013; Skinner & Masuda, 2013; Soga, et al., 2017; Sarkar and Webster, 2017; Lau, et al., 2018; Bao et al., 2018). By referring to the neighbourhood environment, residents of the greenest urban neighbourhoods in New Zealand had significantly lower risks of having mental health problem than those stayed in the least green areas, and the results suggested a dose-response relationship among green environment and health (Richardson et al., 2013). Also, individuals staying in neighbourhoods with more than 15% green space coverage had similarly lowered CVD risks. Meanwhile, the least green neighbourhoods have certain characteristics (*e.g.*, high population density, or urban centres) that also related to CVD risk (Richardson et al., 2013).

Physically inactive has been identified as the fourth leading risk factor for global mortality (6% of deaths globally) (WHO, 2010). Regular physical activity is capable to reduce morbidity and mortality by decreasing NCD and other illnesses, *i.e.* heart disease, diabetes, high blood pressure, colon cancer, feelings of depression/anxiety, and overweight (Siti Nur Afiqah et al., 2015). It also helps in building and maintaining healthy bones, muscles, and joints. According to Hunter & Reddy (2013), tobacco use, excessive alcohol consumption, poor diet, and lack of physical activity contribute to the development of NCD. Based on research, there is strong evidence that considerable health benefits can be achieved even with small amounts of physical activity (Nielsen, et al., 2019). However, according to the International Physical Activity Questionnaire (IPAQ), 33.55% of the population is identified as 'inactive' (Lim, 2017).

Thus, human health, including the NCD is related to the human lifestyle and the activeness of the physical body (Siti Nur Afiqah et al., 2015). The physical activeness is much related to the urbanisation and urban environmental quality, and the setting (Siti Nur Afiqah et al., 2015). The beneficial effects

of physical activity are well known in developed countries. The epidemiological evidence of the positive effects of physical activity on health has been widely reported and confirmed in recent global studies (WHO, 2008a). Conceptually, more physical activity will increase the human health level. Thus, good urban planning or design can increase the level of physical activity subsequently improve human health (Ling et al., 2015; Ling et al., 2018).

From 1996 to 2006, Malaysia saw a dramatic increase in the prevalence of behaviour linked diseases, including a 43% increase in hypertension, 88% increase in diabetes and 250% increase in obesity (Ministry of Health, 2010). The prevalence of NCD risk factors continues to rise in Malaysia. The National Health and Morbidity Survey (NHMS) 2011 and 2015 had shown that the prevalence of total diabetes in Malaysia had increased 50.9% in the period of 9 years (11.6% in 2006, 15.2% in 2011 and further increased to 17.5% in 2015). The increase was mostly contributed by the increased proportion of "undiagnosed diabetes", which were 4.5% in 2006, 8.0% in 2011 and 9.2% in 2015. The prevalence of "impaired fasting glucose" (IFG) has also risen, from 4.2% in 2006 to 4.9% in 2011, and slightly reduced to 4.7% in 2015 (Figure 2) (Ministry of Health, 2011 and 2015).

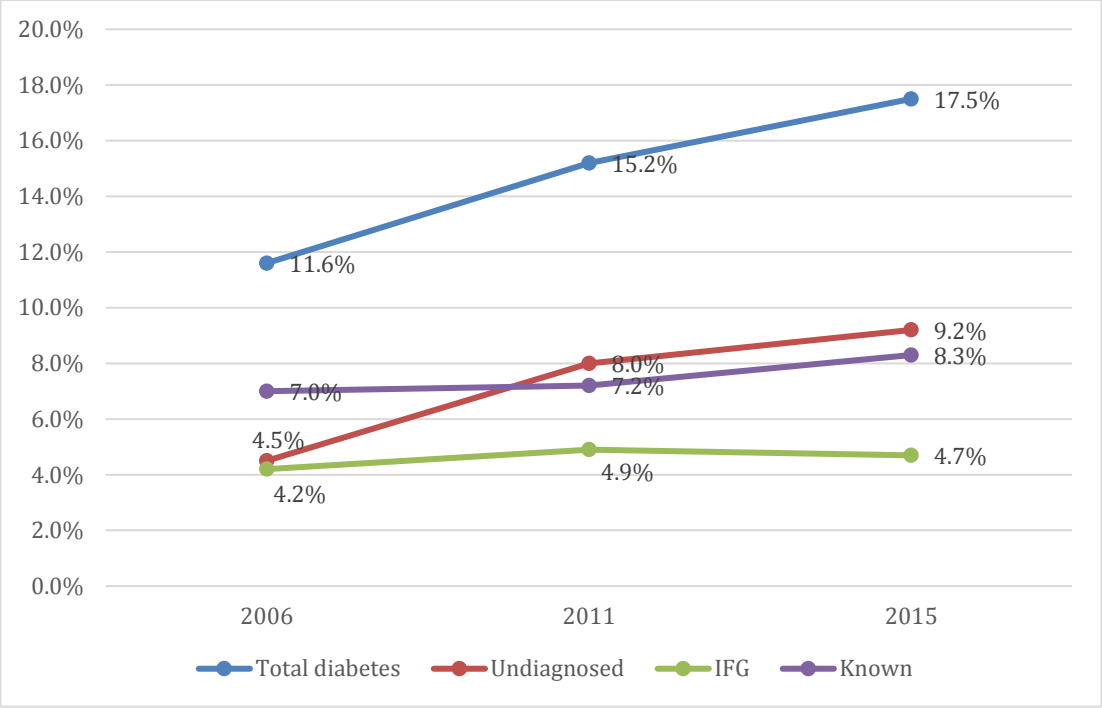


Figure 2: Prevalence of Diabetes (>18 years)
Source: Ministry of Health (2011 and 2015)

The National Health and Morbidity Survey (2011) conducted by the Institute for Public Health highlighted that the nutritional status of the adults aged 18 years and above (based on CPG Classification) is 33.3% (5.4 million) pre-obese and 27.2% (4.4 million) obese. As for children below 18 years (based on weight for age status) 3.9% (0.3 million) are obese. Based on the report by Noncommunicable Diseases Progress Monitor (2017), 71% of death occurrences were due to NCDs, principally cardiovascular diseases (CVD), diabetes, cancers, and chronic respiratory diseases. Malaysia has also recorded 17% of the risk of premature death from target NCDs.

However, until now, the epidemiological evidence for environmental health base has not been clearly identified for the developing countries (WHO, 2008a). The research on the contribution of urban planning (especially neighbourhood) aspects on human health is not comprehensively documented to develop a clear framework or theory of the contribution of urban planning aspects/factors to the human health. Thus, this paper aims to discuss the early finding of a study on human health, physical activities (exercise) and the neighbourhood environment in Malaysia.

QUESTIONNAIRE SURVEY AND SAMPLING OF RESPONDENTS

For this study, the data on health condition, and physical activeness of residents were collected through a questionnaire survey among residents of Section 7, Shah Alam city. At the same time, the respondents' perception of the quality of the neighbourhood environment was also gathered. The questionnaire covers the following aspects:

a) Background of respondents, *i.e.* gender, age, employment, weight and height.
b) Physical activeness of respondents, *i.e.* duration and frequency of physical exercise/sports activities.
c) The quality of neighbourhood environment, *i.e.* respondents' perception on the level of safety in the neighbourhood area, quality of pedestrian facilities, the level of interaction in the neighbourhood, and quality of recreational facilities (lakes, playground and futsal court).
d) Health condition of respondents, *i.e.* diagnosed heart disease, high blood pressure, stroke and osteoporosis.

The stratified random sampling technique was utilized for 97 units of houses that were chosen from a total of 2,648 units of houses in the study area. This covered different housing types and pricing, households with various demographic, socio-economic and pre-existing health backgrounds. In general, the majority of the respondents (82.5%) were under the category of normal as measured by Body Mass Index (BMI). The background of respondents is shown in Table 1.

Table 1: Background of respondents

Variables	Percentage (%)
Gender	
Male	50.5
Female	49.5
Age	
21-30 years old	16.5
31-40 years old	49.5
41-50 years old	25.8
51-60 years old	8.2
More than 60 years old	0.0
Body Mass Index (BMI)	
Underweight (<18.5)	2.1
Normal weight (18.5 – 24.9)	82.5
Overweight (25 – 30)	14.4
Obese (>30)	1.0
Smoking history	
Active smokers	30.9
Passive smokers	25.8
Ex-smokers	15.5
None smoking	27.8
Employment	
Service	54.6
Manufacturing	11.3
Business	16.5
Student	11.3
Not working	6.2

THE RESULTS AND FINDINGS
Health and Physical Activeness

Among the total respondents of 97 residents, there were 24 (24.7%) respondents suffering from High Blood Pressure (HBP), and 3 (3.1%) respondents suffering from heart diseases. No respondent was suffering from stroke or osteoporosis.

From the analysis of questionnaire data, it is found that respondents who were suffering from HBP were less active (as measured in the frequency of physical exercise/sports activities) as compared to those who were not suffering from HBP. The majority (66.67%) of respondents who were suffering HBP were having their exercise less than 2 times per week (Table 2). Meanwhile, there was one-quarter of them were not having exercise every week. However, the majority (57.53%) respondents who were not suffering from HBP were having their exercise 2 times per week. There were only 10% of them were not having exercise every week.

Meanwhile, the majority of respondents who were suffered from HBP also less active as measured in the average duration of every session of exercise/sports activity as compared to respondents who were not suffering from HBP (Table 3). None of the respondents with HBP was having exercise/sports activity for more than an hour. For the respondents with no HBP, there were around 3% having exercise/sports activity more than an hour (Table 3).

Table 2: Health (HBP) and frequency of exercise/sports activities

High blood pressure	Frequency of exercise/sports activities			
	None	1 per week	2 per week	Total
Yes	25.00	41.67	33.33	100.00
No	9.59	32.88	57.53	100.00

Table 3: Health (HBP) and duration of exercise/sports activities

High blood pressure	The average duration for every session of exercise/sports activity			
	< 30 minute	30 minute- 1 hour	1- 2 hour	Total
Yes	45.83	54.17	0.00	100.00
No	28.77	68.49	2.74	100.00

The health condition of respondents as measured in diagnosed heart disease also showed less activeness among respondents who were suffering from heart diseases as compared to those who were not suffering from heart diseases (Table 4 and 5). None of the respondents with heart disease was having exercise more than once in a week (Table 4). Besides, respondents with heart diseases were also not having exercise more than 1 hour in a session of exercise (Table 5). Most of them (66.67%) only taking exercise less than 30 minutes in a session.

For the respondents who were not suffering from heart disease, there were more than 50% taking their exercise twice a week (Table 4). Meanwhile, there were 66% of them having an exercise for 30 minutes to 1 hour, and another 2% taking 1-2 hour for each session of exercise (Table 5).

Table 4: Health (heart disease) and frequency of exercise/sports activities

Heart diseases	Frequency of exercise/sports activities			
	None	1 per week	2 per week	Total
Yes	33.33	66.67	0.00	100.00
No	12.77	34.04	53.19	100.00

Table 5: Health (heart disease) and duration of exercise/sports activities

Heart diseases	The average duration for every session of exercise/sports activity			
	< 30 minute	30 minute- 1 hour	1- 2 hour	Total
Yes	66.67	33.33	0.00	100.00
No	31.91	65.96	2.13	100.00

Table 6: Correlation between duration and frequency of exercise with the quality of the neighbourhood environment

		Duration of exercise	Frequency of Exercise
Duration of exercise	correlation coefficient (r)	1.000	0.651**
	Sig. level (p)	.	0.000
Security	correlation coefficient (r)	0.036	-0.009
	Sig. level (p)	0.723	0.928
Pedestrian facilities	correlation coefficient (r)	0.002	0.188
	Sig. level (p)	0.984	0.065
Human interaction	correlation coefficient (r)	**-0.209***	**0.214***
	Sig. level (p)	0.040	0.035
Neighbourhood view	correlation coefficient (r)	-0.100	**0.247***
	Sig. level (p)	0.330	0.015
Quality of lake	correlation coefficient (r)	**-0.279****	**0.248***
	Sig. level (p)	0.006	0.014
Quality of children playground	correlation coefficient (r)	-0.186	**0.254***
	Sig. level (p)	0.068	0.012
Quality of futsal court	correlation coefficient (r)	-0.054	0.005
	Sig. level (p)	0.600	0.960

Note:
* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

It showed that active physical activities (exercise/sports) were associated with the healthy body of respondents as measured in NCD (heart disease and HBP).

Physical Activeness and Perception of the Quality of Neighbourhood Environment

Effects of neighbourhood environmental aspects on physical activeness of respondents were analysed using correlation tests. Perception of respondents on the quality of neighbourhood environmental aspects had been correlated with the duration as well as the frequency of exercise (physical activeness) for the study. Based on the results (Table 6), some of the neighbourhood environmental aspects were significantly correlated (at 0.05 or 0.01 level) with the physical activeness (duration or frequency of exercise/sports activity). These aspects were human interaction, neighbourhood views or esthetical aspect, quality of the lake, and quality of children playground.

The physical activities (as measured by frequency of exercise) were positively and significantly correlated (at 0.05 level) with the independent variables, *i.e.* human interaction, neighbourhood views, quality of the lake, and quality of children playground. It means that the good quality of the neighbourhood's social and physical aspects will increase the frequency of physical activity by respondents in the study area.

However, physical activities (as measured by duration of exercise) were negatively correlated (significant at 0.05 or 0.01 level) with the human interaction and quality of the lake. It showed that the good human interaction and good quality of lake tend to reduce the duration of exercise for each session. Neighbourhood views and quality of children playground were not significantly correlated (even at 0.05 level) with the duration of exercises. Other neighbourhood aspects *i.e.* security, pedestrian facilities, and quality of futsal court were not significantly correlated (even at 0.05 level) with physical activity as measured by the frequency as well as the duration of exercises.

CONCLUSIONS AND RECOMMENDATION

To conclude, the quality of a few neighbourhood environmental aspects *i.e.* children playground, lake and neighbourhood view is significantly affecting the physical activeness (exercises) of respondents. Then, the physical activeness is positively associated with human health as measured in NCD (heart diseases and HBP). It shows that neighbourhood environmental (physical and social) aspects are potentially affecting the healthy lifestyle of people living in a neighbourhood. Thus, it is recommended that government together with developers, contractors, planners, and designers to put more effort in providing a high quality of neighbourhood environment, *i.e.* quality of playgrounds/lakes/recreation areas, good views, and good environment for social interaction. With good planning and design, it will potentially increase the physical activeness of residents and their health condition. Besides, more research should be carried out concerning human health and urban environment. It should cover areas with different types of urban settings, designs, and socio-economic backgrounds.

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