

**NEIGHBOURHOOD SOCIAL AND PHYSICAL
DISORDERS AND ADOLESCENTS' STRESS
IN KUALA LUMPUR, MALAYSIA**

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**FACULTY OF BUILT ENVIRONMENT
UNIVERSITY OF MALAYA
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ABSTRACT

Neighbourhoods are replete with high levels of social and physical phenomena that can generate a sense of hazard for the residents living in the area. Neighbourhood experiences and perceptions are more or less influenced by the social and physical circumstances present in the immediate living environment. Investigations of health conditions based on neighbourhood boundaries have been conducted since a century ago. However, in recent years, more attempts have been made to explore the associations between regions and health by focussing on the behaviours of the residents. Today, a variety of theoretical and analytical models have identified the direct and indirect pathways between neighbourhoods and mental health. One of these pathways is that of the neighbourhood which is believed to affect the mental health of the residents through the “neighbourhood disorders”. When a neighbourhood is disordered, it affects the residents’ and neighbourhoods’ conditions alike because there is no control over its maintenance. Neighbourhood disorders have been divided into two main components: “social disorders” and “physical disorders”. Since certain groups like adolescents are more vulnerable to the consequences of mental health, the main objective of this study was to assess the association between neighbourhood social and physical disorders as experienced and perceived by adolescents and their stress-level. A survey was conducted on 844 secondary school students who were aged between 13-15 years old in the Kuala Lumpur region of Malaysia between Januarys to May, 2014. The Adolescent Stress Questionnaire (ASQ) was used to measure their stress-level. Data were analysed in four stages: first, the adolescents’ experienced and perceived neighbourhood social and physical disorders and adolescents’ stress-level were examined separately through the factor analysis method. This method was used to classify the correlated variables. Second, the association between neighbourhood social and physical disorders and adolescents’ stress-level were assessed with other factors including (a) age, (b) gender, (c)

socioeconomic status, (d) family functioning, and (e) individual preferences. This was determined by T-test and one way ANOVA. Third, multivariate regression was performed so as to analyse all the variables which include neighbourhood disorders, stress-level, age, gender, socioeconomic status, family functioning, and individual preferences. A final model was also introduced to define the association between neighbourhood disorders and adolescents' stress. Finally, spatial autocorrelation analysis using ArcGIS software was performed to illustrate the disorders and stress across neighbourhoods. The results of this research showed that there was a positive association between neighbourhood disorders as experienced and perceived by adolescents and their stress-level. There was a statistically significant difference among adolescents' individual preferences, their family functioning, and their socioeconomic status in the experiences and perceptions of neighbourhood disorders and stress. However, there was no statistically significant difference in different gender. The results of spatial analysis showed the hot spots in Kuala Lumpur city which reported high level stress and neighbourhood disorders. From the findings, it was concluded that neighbourhood social and physical disorders are significant enough to determine the stress-levels experienced among adolescents in the Kuala Lumpur region of Malaysia. It was recommended that urban planners and policy makers need to identify neighbourhoods that were more at risk of social and physical disorders in order to develop planning and building policies and mitigation actions which can further help the country to become healthier communities.

Keywords: Mental Health, Urban Health, Neighbourhood Disorder, Urban Stress.

ABSTRAK

Kawasan kejiranan biasanya dipengaruhi oleh fenomena sosial dan fizikal yang tinggi sehingga boleh menimbulkan ancaman di kalangan penduduk setempat. Pengalaman di sesebuah kejiranan, sedikit sebanyak dipengaruhi oleh keadaan sosial dan/ atau fizikal yang wujud dalam persekitaran kehidupan. Kajian tentang pengaruh keadaan kejiranan terhadap tahap kesihatan telah dilakukan semenjak seabad yang lalu. Walau bagaimanapun, sejak kebelakangan ini, lebih banyak usaha telah dilakukan bagi mengkaji hubungan di antara kawasan kejiranan dan kesihatan. Pada masa kini, pelbagai model teoritikal dan analitikal telah mengesahkan hubungkait langsung dan tidak langsung di antara kejiranan dan kesihatan mental. Salah satu daripada hubungkait ini adalah faktor kejiranan yang dipercayai boleh mempengaruhi kesihatan mental penduduk melalui ‘gangguan kejiranan’. Apabila sesuatu kejiranan terganggu, ia akan mempengaruhi keadaan kehidupan penduduk dan kawasan kejiranan tersebut. Malah ini juga bermaksud bahawa kejiranan itu telah kehilangan kawalan. Gangguan kejiranan boleh dibahagikan kepada dua komponen utama: “gangguan sosial” dan “gangguan fizikal”. Disebabkan kumpulan-kumpulan tertentu seperti golongan remaja lebih terdedah kepada kesan-kesan kesihatan mental, maka objektif utama kajian ini adalah untuk menilai hubungkait antara kejiranan dan gangguan sosial dan fizikal yang dialami oleh golongan remaja dan juga tahap tekanan yang dialami mereka. Satu kajian selidik dijalankan terhadap 844 orang pelajar sekolah menengah yang berumur daripada 13 hingga 15 tahun di kawasan Kuala Lumpur, Malaysia dari bulan Januari hingga Mei, 2014. Borang Kaji Selidik Tekanan Golongan Remaja (ASQ) digunakan bagi mengukur tahap tekanan mental mereka. Data kemudian dianalisis dalam empat peringkat: pertama, persepsi gangguan kejiranan sosial dan fizikal dan tahap tekanan mental golongan remaja dikaji secara berasingan melalui kaedah analisis faktor. Analisis faktor juga digunakan bagi mengenalpasti pemboleh ubah yang berkorelasi dan seterusnya

mengelompokkan pemboleh ubah tersebut. Kedua, hubungan di antara gangguan kejiiran sosial dan fizikal dan tahap tekanan mental dinilai melalui faktor-faktor lain seperti (a) umur, (b) jantina, (c) status sosio-ekonomi, (d) fungsi keluarga, dan (e) kecenderungan individu dengan menggunakan *T-test* dan *one way ANOVA*. Ketiga, analisis regresi multivariat dijalankan bagi menganalisis semua pemboleh ubah termasuklah gangguan kejiiran, tahap tekanan, umur, jantina, status sosioekonomi, fungsi keluarga, dan kecenderungan individu. Satu model kajian juga diperkenalkan bagi menentukan hubungan diantara gangguan kejiiran dan tahap tekanan mental. . Akhir sekali, analisis spatial autokorelasi yang menggunakan perisian ArcGIS dilakukan bagi menggambarkan hubungan di antara kawasan kejiiran dan tahap tekanan mental. Hasil kajian menunjukkan bahawa terdapat hubung kait yang positif di antara gangguan kejiiran yang dirasakan oleh golongan remaja dan juga tahap tekanan mental mereka. Terdapat juga perbezaan statistik yang signifikan di antara kecenderungan individu golongan remaja, fungsi keluarga dan juga status sosioekonomi mereka didalam persepsi gangguan kejiiran dan tahap tekanan mental. Walau bagaimanapun, tiada perbezaan statistik yang signifikan didapati diantara kumpulan umur dan jantina yang berbeza. Kesimpulan yang dapat dibuat dari kajian ini ialah gangguan kejiiran sosial dan fizikal adalah penting dalam menentukan tahap tekanan mental dikalangan golongan remaja di Kuala Lumpur, Malaysia. Ia boleh dikatakan sebagai satu keperluan bagi perancang bandar dan penggubal dasar untuk mengenalpasti kawasan kejiiran yang lebih berisiko dalam mengalami gangguan sosial dan fizikal. Selain itu, maklumat yang didapati dari kajian ini juga dapat membolehkan penggubalan dasar untuk mengambil langkah mitigasi yang baik untuk pembentukan masyarakat yang lebih sihat dan sejahtera.

Kata kunci: Kesihatan Mental, Kesihatan Bandar, Gangguan Kejiiran, Tekanan Bandar.

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TABLE OF CONTENTS

ABSTRACT	iii
ABSTRAK	v
ACKNOWLEDGEMENT	vii
TABLE OF CONTENTS	viii
LIST OF FIGURES	xiii
LIST OF TABLES	xiv
LIST OF ABBREVIATIONS	xv
LIST OF APPENDICES	xvi
 CHAPTER 1: INTRODUCTION.....	1
1.1 Background.....	1
1.2 Statement of problem.....	5
1.3 Research aim and objectives.....	7
1.4 Research questions.....	7
1.5 Significance of study	8
1.6 Scope of study.....	9
1.7 Thesis organization.....	10
 CHAPTER 2: LITERATURE REVIEW.....	12
2.1 Neighbourhoods and Neighbourhood Disorders	13
2.1.1 The residential neighbourhood in the global context.....	13
2.1.2 Using neighbourhoods in health studies	16
2.1.3 Concept of neighbourhood disorders	21
2.1.3.1 Definition and origin	21
2.1.3.2 Social disorders and quality of neighbourhoods	25
2.1.3.3 Physical disorders and quality of neighbourhood	29

2.1.4 Possible impact of neighbourhood disorders	30
2.1.4.1 Perceptions of neighbourhood disorders	34
2.1.4.2 Experiences of neighbourhood disorders	35
2.2 Stress as a Mental Health Outcome	37
2.2.1 Understanding stress	37
2.2.1.1 Desirable and Undesirable Stress	38
2.2.1.2 Physical Stress	40
2.2.1.3 Psychological Stress	41
2.2.1.4 Social Stress	42
2.2.1.5 Causes of Stress	42
2.2.2 Stress in adolescents	44
2.2.2.1 Adolescents	44
2.2.2.2 Adolescents' stress	46
2.2.3 Measuring stress in adolescents	47
2.3 Neighbourhood Disorder and Adolescents' Stress	49
2.3.1 Association between Neighbourhood Disorders and Adolescents' stress	50
2.3.2 Spatial analysis of neighbourhood disorders and stress	53
2.3.3 Moderators and Mediators of the association between neighbourhood disorders and adolescents' stress	55
2.3.3.1 Potential moderators	55
2.3.3.2 Potential mediators	59
2.4 Neighbourhood and Stress in Malaysian Context	61
2.4.1 Neighbourhood concept in Malaysia	61
2.4.1.1 Green neighbourhoods	63
2.4.1.2 Gated and guarded neighbourhoods	64
2.4.2 Neighbourhood disorders and stress in Malaysia	65
2.4.2.1 Social Disorders	66

2.4.2.2	Physical Disorders	70
2.4.2.3	Neighbourhood disorders and stress in Malaysia.....	73
2.4.3	Study Framework.....	75
CHAPTER 3: METHODOLOGY		78
3.1	Study Area	78
3.2	Study Design.....	82
3.2.1	Why neighbourhood-based approach?.....	82
3.3	Study population.....	84
3.4	Sample size	84
3.5	Sample selection	85
3.6	Participants	86
3.7	Data collection	86
3.7.1	Pilot study	87
3.7.2	Measuring neighbourhood disorders.....	90
3.7.3	Measuring Stress-level.....	91
3.7.4	Adolescent Stress Questionnaire (ASQ).....	92
3.8	Study variables.....	96
3.8.1	Neighbourhood disorders (independent variables)	97
3.8.2	Stressful life events (dependent variables)	98
3.8.3	Moderators and mediators.....	101
3.9	Data Analysis.....	101
3.9.1	Parametric tests	102
3.9.2	Justification for Multilevel analysis.....	103
3.9.3	Analysis of neighbourhood disorder	103
3.9.4	Analysis of stressful life events	104
3.9.5	Association between neighbourhood disorders and stress.....	104

3.9.6 Spatial analysis of neighbourhood disorders and stress.....	106
CHAPTER 4: RESULTS.....	110
4.1 Baseline Information	110
4.1.1 Demography.....	110
4.1.2 Socioeconomic status.....	111
4.1.3 Family functioning.....	112
4.1.4 Individual factors	116
4.2 Neighbourhood disorders.....	117
4.2.1 Adolescents' experiences and perceptions of neighbourhood disorders	117
4.2.2 Neighbourhood disorders and other factors	119
4.3 Findings of stress-level assessment	128
4.3.1 Adolescent stress-level.....	128
4.3.2 Stress-level and other factors	131
4.4 Findings of the association between neighbourhood disorders and stress	135
4.4.1 Multivariate Analysis.....	136
4.5 Spatial analysis results.....	137
4.5.1 Moran's I.....	137
4.5.2 LISA.....	137
4.5.3 Stress distributions	140
4.5.4 Distinguishing the hot spots where reported stress and neighbourhood disorders are high.....	141
CHAPTER 5: DISCUSSION	144
5.1 Living in a disordered neighbourhood.....	146
5.1.1 Experiences and perceptions of neighbourhood disorders.....	146
5.1.2 The impact of neighbourhood physical disorders	147
5.1.3 The impact of neighbourhood social disorders	153

5.1.4 The roles other factors play in experiences and perceptions of neighbourhood disorders	155
5.2 Stressful life events for adolescents.....	162
5.2.1 Effects of socioeconomic status on stress-level	165
5.2.2 Academic life's effects on stress-level	166
5.2.3 Family and home life's effects on stress-level.....	167
5.2.4 Neighbourhood satisfaction's effects on stress-level.....	168
5.3 How are neighbourhood disorders related to adolescents' stress-level?	170
5.3.1 Role of age and gender on the association between neighbourhood disorders and stress.....	172
5.3.2 Parental Socioeconomic status's effects on the association between neighbourhood and stress.....	174
5.3.3 Family functioning's effects on the association between neighbourhood and stress.....	175
5.3.4 Effect of Individual-level factors on the association between neighbourhood and stress.....	178
5.3.5 Hot spots in the city with high-level of reported stress and neighbourhood disorders	182
CHAPTER 6: CONCLUSION.....	185
6.1 Research significance	185
6.2 Contribution to the knowledge	186
6.3 Policy implications	186
6.4 Limitations	189
6.5 Directions for Future Research	191
REFERENCES.....	194
APPENDICES	217

LIST OF FIGURES

Figure 2.1: Flow of the literature review	13
Figure 2.2: Neighbourhood concept in Malaysia.....	62
Figure 2.3: Neighbourhood concept based on size in Malaysia.....	63
Figure 3.1: Location map of the study area	80
Figure 3.2: Neighbourhoods' boundary in Kuala Lumpur, Malaysia.....	81
Figure 3.3: Participants in the process of filling up the questionnaires	89
Figure 3.4: Giving instructions to the participants.....	89
Figure 3.5: Study framework	97
Figure 4.1: Parental report of family functioning	113
Figure 4.2: Adolescents general health status	115
Figure 4.3: Mean difference in the experiences and perceptions of neighbourhood disorders among different age.....	120
Figure 4.4: Mean difference in the experiences and perceptions of neighbourhood disorders among different income groups.....	121
Figure 4.5: Mean difference in the experiences and perceptions of neighbourhood disorders among different status of parental education.....	122
Figure 4.6: Mean difference in the experiences and perceptions of neighbourhood disorders among different family employment status.....	123
Figure 4.7: Adolescents' stressful life events	131
Figure 4.8: Spatial analysis of stress-level.....	138
Figure 4.9: Spatial analysis of neighbourhood disorders.....	139
Figure 4.10: Stress-level distribution across urban neighbourhood.....	140
Figure 5.1: Flow of discussion chapter	145
Figure 5.2: Significant factors contributed in the adolescents' stress-level.....	165

LIST OF TABLES

Table 2.1: Neighbourhood problems in the literature	22
Table 2.2: Different tools to measure the stress	48
Table 3.1: The number of selected secondary schools based on population density.....	85
Table 3.2: Descriptive analyses of study participants	86
Table 3.3: Reliability test of adolescents stress questionnaire	92
Table 4.1: Demographic characteristics of participants	111
Table 4.2: Descriptive results of socioeconomic status	112
Table 4.3: Parents' report of children health status.....	115
Table 4.4: Students' report about the transportation mode and playing out-door.	116
Table 4.5: Neighbourhood factor analysis	117
Table 4.6: Factor loadings of neighbourhood disorder	118
Table 4.7: Significant difference among adolescents' age in experiences and perceptions of neighbourhood social and physical disorders	119
Table 4.8: Significant difference among family income in experiences and perceptions of neighbourhood social and physical disorders	120
Table 4.9: Significant difference among family education in experiences and perceptions of neighbourhood social and physical disorders	121
Table 4.10: Significant difference among family employment status in experiences and perceptions of neighbourhood social and physical disorders.....	122
Table 4.11: Summary of significant difference in the experiences and perceptions of neighbourhood disorders	127
Table 4.12: Factor loading of ASQ	128
Table 4.13: Summary of significant difference regarding the stress-level	134
Table 4.14: Pearson's r of the association between neighbourhood factors and stress	135
Table 4.15: Models of the association between neighbourhood disorders and stress...	136
Table 4.16: Neighbourhood ranking	141

LIST OF ABBREVIATIONS

ASQ	Adolescents Stress Questionnaire
DASS	Depression Anxiety Stress Scale
FHG	Federal Housing Grants
LISA	Local Indicators of Spatial Association
MHLG	Ministry of Housing and Local Government
MNMHS	Malaysia National Mental Health Survey
MOE	Ministry of Education
MOH	Ministry of Health
MTO	Moving To Opportunity
NUP	National Urbanisation Policy
PCA	Principal Component Analysis
PSS	Perceived Stress Scale
SEA	South East Asia
SES	Socioeconomic Status
UM	University of Malaya
UNFPA	The United Nations Fund for Population Activities
UNICEF	The United Nations International Children's Emergency Fund
USGBC	The United States Green Building Council
WHO	World Health Organization

LIST OF APPENDICES

Appendix A: Confirmation letters.....	224
Appendix B: Consent letter.....	226
Appendix C: Parents' questionnaire	227
Appendix D: Students' questionnaire	230
Appendix E: Neighbourhood disorders photos	237
Appendix F: Publication	241
Appendix G: List of selected secondary schools	252

CHAPTER 1: INTRODUCTION

1.1 Background

Neighbourhoods are replete with high levels of social and physical phenomena that can generate a sense of hazard for human-beings. An individual's location within certain neighbourhoods can importantly influence the experiences of his/her daily lives. One way to understand how neighbourhoods might be differently experienced by the individuals is through assessing the neighbourhood problems. The information thus gathered can enable others to understand which groups are more at risk both mentally and physically. However, neighbourhood experiences and perceptions may be as much influenced or more influenced by the social and physical circumstances present in nearby areas Sampson, Morenoff & Gannon-Rowley (2002). In recent years, the neighbourhood has become the focus of much research investigating health disparities which are conducted mainly to understand the variations in exposure to risk and neighbourhood segregation (Filip & Charles, 2004). For the benefit of understanding the events happening in the neighbourhood's social life, it is important to recognize people's experiences and their perceptions within an appropriate spatial context like residential neighbourhoods (Abbott, 1997).

Investigation of health conditions based on neighbourhood boundaries dates back nearly a century (Pfeiffer, Frankel, Dublin & Corwin, 1917). Pfeiffer and his colleagues reported on the prevalence of sickness by age and gender in the Chelsea neighbourhood of New York City. Their main aim was to establish a basis for developing constructive health programs. They claim that, "The neighbourhood is the first link in general community action for better health. Among neighbours, health matters can and are being discussed more freely and intimately than among any other large group of people" (Pfeiffer et al., 1917, p. 14).

Following this, the association between deteriorating regions and health, including behaviours, physical and mental health outcomes was conducted by Myerson (1940) who demonstrated that social settings can also contribute to mental health disorders. This study was the first of its kind to take patients out of the clinic by evaluating the individual in his/her natural living environment. Conducted in Chicago where the first example of urban association was considered, Myerson's study looked at around 40,000 participants with mental disorders who had been sent to public and private hospitals. These patients were distinguished by their home addresses and specific emphasis like "disorganized" areas was indicated on their addresses (Myerson, 1940). From the findings, Myerson (1940) concluded that people with mental health disorders tended to be isolated in their living places.

Following Myerson's study, other neighbourhoods with suitable settings also came under focus as studies attempt to deal with health related problems. The appraisal methods of measuring the quality of the neighbourhood, for example, provided data for neighbourhood planners and health professionals to develop health programmes (Nelbach, 1950). Similarly, a study from Milio (1967) addressed the fact that public health professionals in particular neighbourhood settings can offer health programmes which can serve as suitable preventive measures families in the neighbourhood can adopt. It was suggested that families and their children can be educated on mental health concerns and how this can be contained or curtailed within a built environment. Milo's study concluded that the small size of the neighbourhood and its flexible nature of the setting accompanied by the feedback afforded by residents can provide the opportunity for families to deal with the issue of health problems in a more appropriate manner.

Today, a variety of theoretical and analytical models have identified the direct or indirect link between mental health and neighbourhoods (Kupersmidt, Griesler, DeRosier, Patterson & Davis, 1995; Ensminger, Lamkin & Jacobson, 1996; Osypuk, Schmidt, Bates, Tchetgen-Tchetgen, Earls & Glymour, 2012). The latest finding in the last decade or so show that neighbourhood perceptions have an important role to play in changing the quality of the individual's health. This may encompass specific factors such as socioeconomic status (Steptoe & Feldman, 2001; Petersen, Marsland, Flory, Votruba-Drzal, Muldoon & Manuck, 2008; Gallo et al., 2012; Mathur, Erickson, Stigler, Forster & Finnegan, 2013), exposure to violence (Rosenthal & Wilson, 2003; Rasmussen, Aber & Bhana, 2004), and neighbourhood collective efficacy (Sampson, Raudenbush & Earls, 1997) as they have been noted to make remarkable effects.

In the past twenty years, after studying the association and linkage of health outcomes and neighbourhoods, researchers began placing a growing emphasis on neighbourhoods and how they could be linked to human mental health disorders and their social well-being. This trend reflects a renewed interest in the need to focus on contextual factors which are deemed to be able to influence an individual's mental health. Since then, neighbourhoods have been strongly patterned by research as it is believed that the different dimensions of every neighbourhood can enable researchers to explain and address the existence of health and social inequalities.

Neighbourhoods differ from one to another due to geographical locations and likewise, health outcomes in different neighbourhood could also be caused by a variety of factors and these outcomes could be in the form of physical activity (Dulin-Keita, Kaur Thind, Affuso & Baskin, 2013), stress (Brenner, Zimmerman, Bauermeister & Caldwell, 2013), crime (Sampson et al., 1997), and depression (Cutrona, Wallace & Wesner, 2006). In the study conducted by Cutrona et al. (2006), it was found that neighbourhoods with poor

quality housing, few assets, and contained hazardous conditions are related to the mental health outcomes of the residents. It appears that depression suffered by the individual in a neighbourhood can impact on the individual's burdens (e.g., low income, unemployment status, or poor family functioning). Based on their study, they conclude that neighbourhood problems can increase the stress of a person and thereby diminish the person's ability to cope with the risk of mental health outcomes.

Theories indicating how neighbourhoods are linked to mental health were derived from the principle that people are embedded in a social and spatial context, and as a result, are exposed to the elements found in their living environment and these may be harmful to their mental health (Leventhal & Brooks-Gunn, 2000). It appears that some people are likely to spend time in disadvantaged neighbourhoods due to segregation, and the conditions present in these neighbourhoods can influence their health. Thus, this implies that the neighbourhood context can help to explain disparities in health outcomes across groups. A broad interpretation of this classic epidemiology exposure model suggests that in addition to physical characteristics, the social context of the neighbourhood may influence health, specifically by influencing the individual's exposure to stressors. When stressors accumulate over time, they may have deleterious effects on the person's health including obesity, elevated blood pressure, and poor mental health (Burdette & Hill, 2008; Karb, 2010; Powell et al., 2010; Shivpuri & Gallo, 2012; Dulin-Keita et al., 2013; Powell-Wiley et al., 2013). From all these descriptions of neighbourhoods, it would therefore seem that the experiences and perceptions of neighbourhood problems can be counted as one of the significant aspects of the environment which can impact on adolescents' development and their mental health outcomes (Aneshensel & Sucoff, 1996; Truong & Ma, 2006; Hill & Maimon, 2013).

1.2 Statement of problem

In 2000, the Malaysia National Mental Health Survey (MNMHS) demonstrated that the prevalence of mental health outcomes among Malaysian teenagers with emotional problems and anxiety is nearly 50% (WHO, 2011, p. 5). Studies also confirm that certain groups like adolescents are more vulnerable to the consequences of mental health (Larson & Ham, 1993; Ge, Lorenz, Conger, Elder & Simons, 1994; Romeo & McEwen, 2006; WHO, 2012, p. 7). Therefore, study on adolescents' mental health outcomes can remarkably contribute to have a healthier society.

Among the various mental health outcomes, it appears that stress is one of the main health outcomes experienced in adolescence. This is due to the inevitable physical changes the adolescent experiences as well as the kind of interactions they have had with others in the social and physical environment surrounding them (Rahmah & Shahrniza, 2008; Esfandiyari, Baharudin & Nowzari, 2009).

In his study, Yusoff (2010) indicates that nearly 26.1% of the secondary school students in *Kota Bharu* in Malaysia suffer from stress. His study suggests that academic issues were the main cause of stress among adolescents. A study conducted by Latif, Razak & Cheras (2007) illustrate that 70% of the reasons cited as linked to behavioural problems among the *Hulu Langat's* schoolboys, Malaysia was stress. It appears that much of the previous studies concur that a continuous experience of stress can affect mental health of the adolescents of a neighbourhood.

Experiences of stress have been studied in Malaysia before and most stress experiences, it was found, are related to life events such as academic studies, parental behaviours, or peer influence (Yusoff, 2010). From the review of a large body of literature, it seems that stress can also be related to neighbourhood problems (Leventhal & Brooks-Gunn, 2000).

For instance, evidence is provided for the adverse effect of neighbours with lower socioeconomic status¹ on adolescents' mental health, possibly more so for externalizing (acting out and aggressive) behaviours than internalizing (depressive and withdrawn) behaviours. In the Malaysian context, assessing the different aspects of neighbourhoods is not a new approach as the study of neighbourhoods can add on to contributions focussing on the wellbeing of residents (Bajunid, Abbas & Nawawi, 2013). However, it was noted that there is lack of evidence to be found showing the association between neighbourhood problems and stress. This gap is covered in the third objective of this study.

This research aims to address this gap in two different aspects. The first aspect is to assess this association and to do this, it is necessary to be clear on how the adolescents of a particular neighbourhood experience and perceive neighbourhood problems. Next, this research also aims to understand whether or not these experiences and perceptions affect them negatively by contributing to their mental health outcomes. Nonetheless, it was mentioned earlier that neighbourhood is related to social cohesion and the satisfactions of residents is due to its safety-level (Bajunid et al., 2013). However, thus far, there is no evidence which can show the experience and perceptions of neighbourhood problems among adolescents. This issue is addressed in the first objective of the current research.

The second aspect is to focus on the issue related to the adolescents' stress-level. In the past, many studies had employed specific instruments to collect information, but there were not specifically designed for the measuring the adolescents' stress. For example, Yaacob, Juhari, Talib & Uba (2009) had used the Perceive Stress Scale for measuring the

¹ Families with monthly salary of bellow of RM1999 were counted as low-income, between RM1999 and RM3499 as medium, and RM3500 and above as high-income. Income, education, and employment are three indicators of socioeconomic status in this study. Source: Department of Statistics (2010).

stress-level of Malaysian adolescents although the instrument was basically designed for adults in accordance with the scale's instruction (Cohen, Kamarck & Mermelstein, 1983). Due to this incompatibility, it is therefore noted that specifically designed tools need to be developed for the purpose of measuring adolescents' stress-levels. This element of suggestion is further addressed in the second objective of this research.

1.3 Research aim and objectives

The broad aim of this research is to assess the association between neighbourhood factors and stress as a mental health outcome among Malaysians adolescents. This study excludes other factors as it emphasizes only on the social and physical factors of residential neighbourhoods in Kuala Lumpur, Malaysia. To achieve the broad aim of this research, three objectives are developed and they are as follows:

1. To assess neighbourhood social and physical disorders as experienced and perceived by urban adolescents.
2. To determine the stress level of adolescents living in urban neighbourhoods.
3. To examine the association between neighbourhood factors and stress-levels among adolescents.

1.4 Research questions

In order to fulfil the aim and objectives outlined above, three research questions are formulated.

1. Do Malaysian adolescents living in urban neighbourhoods experience and perceive neighbourhood social and physical disorders?
2. What are the stress levels of Malaysian adolescents living in urban neighbourhoods?

3. Is there any association between neighbourhood social and physical disorders as experienced and perceived by adolescents living in urban neighbourhoods and their stress-levels?

1.5 Significance of study

The outcome of this study can be considered in many aspects. One of the main contributions of this research is to highlight the fact that there is an association between neighbourhood social and physical disorders and adolescents' stress living in urban neighbourhoods such as Kuala Lumpur, Malaysia. In addition, the information gathered from this research can help others to be aware that living places can contribute to mental health issues. Although countries have advanced over the years, health inequalities remain an important public health issue, especially in disadvantaged neighbourhoods (Vyncke et al., 2013). Despite the large body of literature identifying the significance of assessment, some scholars still believe that this area of research is still underdeveloped, being in its methodological and theoretical infancy (Odgers, Caspi, Bates, Sampson & Moffitt, 2012; Hill & Maimon, 2013). To create a better awareness, research could examine not just the individual characteristics of neighbourhoods, but also the characteristics of the social and physical contexts in which individuals are embedded in order to fully understand the health disparities currently existing (Cummins, Curtis, Diez-Roux & Macintyre, 2007).

Undoubtedly, psychological or sociological models could be used to assess the causes of psychosocial distress within individuals, but mapping and spatial analysis can promote a far better understanding of stress variation occurring across different neighbourhoods. Here, the serious issue in studying the association between neighbourhoods and stress is in tracking the neighbourhood disparities, specifically, the groups who are more at risk (e.g., identifying the locations of those more at risk people so that health services can be

delivered). From the outcome of this research, it would be known that the approach of mapping used can further promote a better understanding about the association between mental health and built environment. Further, by recognizing the zones or neighbourhoods which are more likely to create more problems for residents, the delivery of relevant health services would be easier and more effective.

On April 7, 2010, which has been nominated as Urban Health Day, the World Health Organization announced the essential contribution of urban planning as a first action for healthy behaviours and safety. This action can significantly increase the opportunity for people to enjoy better urban living conditions. This has been stimulated by the early works which identified health disparities occurring in various organizations such as the American Academy of Paediatrics. The outcome of this research indicating the stress-level of adolescents living in urban neighbourhoods can also help to raise awareness which can then be implemented into the strategies and policies of buildings and planning.

1.6 Scope of study

This study works on the association between neighbourhood social and physical disorders, not the cause and effect side of it. The underlying mechanism through which a neighbourhood may contribute to the adolescents' stress-level is also introduced. However, this study does not determine if neighbourhood affect the stress or vice versa. To see whether neighbourhood affects stress or stress lead people to live in low quality neighbourhoods further investigations including in-depth interview required. As this study works on large population, it would not possible to say which affect the other one. Furthermore, this study assesses the neighbourhood problems as stated in the study of Sampson & Raudenbush (1999), and does not include neighbourhood problems which are counted as crimes (e.g., burglary).

1.7 Thesis organization

The thesis is organized into six chapters. Chapter One serves as the Introduction to the research area. It explicates the current situation in the study of neighbourhoods and stress as a mental health outcome. The chapter begins by providing the background to the study, the history of past studies focussing on neighbourhoods based on areas and living places. It then touches on the research gap and the resolution challenges. The research aim and objective follows and as a result, three research questions were formulated.

Chapter Two serves as the Literature Review and it develops by looking at previous studies emphasising on neighbourhoods and adolescents' mental health. This is done by identifying potentially stressful and supportive dimensions of the neighbourhood environment and their association to health outcomes. The chapter is organized in three parts. The first part deals with the concept of neighbourhood, its definitions, and problems. The second part deals with stress as the mental health outcome, its definitions and the different types of stress and the different methods to measure stress. The selected methods used in the current research to measure the adolescents' stress of this study are also explained. The third part deals with the association between neighbourhood and mental health, and to ensure that this is more tangible, the study framework drawn from the literature review is introduced.

Chapter Three serves as the Methodology and it contains an explanation of approaches used in the current research. The chapter provides a description of the study area which explains the data source, population and samples as well as how neighbourhood disorders and stress-levels are measured. It is then followed by the explanation on method of analysis. In the analysis, the association between perceived disorders and other factors such as individual-level will be mentioned as being assessed but through the regression

analysis, the chapter will then show how correlation of stress-level and neighbourhood disorders is computed.

The results of above mentioned analysis are presented in Chapter Four of this study and finally, plausible pathways of correlation between neighbourhood problems and stress-level are assessed in Chapter Five. Finally, research limitation, directions for future studies, and research contribution are brought in last chapter.

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CHAPTER 2: LITERATURE REVIEW

The literature review chapter is organised into four main parts. First, it looks at the definition of the concept of neighbourhood from a global and local context. It then continues with explanations about the different approaches of using the concept of neighbourhoods in studying health. Based on this, the chapter will also aim to explain why neighbourhood-based design is deemed as the better approach for the current research. Following this, the chapter will proceed with looking at the definitions of neighbourhood disorders, and how these disorders are categorized, and what the items listed in each category comprise of. At the end of this discussion, the possible outcomes of neighbourhood disorders including their experiences and perceptions are explained. It is hoped that this can provide the basic knowledge for measuring neighbourhood disorders as defined by Sampson & Raudenbush (1999) and Ross & Mirowsky (1999).

The second part of this chapter is related to looking at the mental health outcomes which are the dependent variables employed in the current research. Stress and definitions of the various types of stress, its consequences, and the different tools used for measuring stress are also discussed. Included with this part is the justification for using the instrument of the Adolescents Stress Questionnaire (ASQ) with all variables used in the research duly described in detail.

The third part of this chapter will focus on looking at the possible association between neighbourhood and stress. It comprises a discussion about neighbourhood disorders and mental health since it is possible that neighbourhood disorders may contribute to the health and wellbeing of adolescents. Finally, the concept of neighbourhood and neighbourhood disorders have been reviewed in the last part. Based on all that will be discussed as mentioned above, a study framework is then formulated as is shown in Figure 2.1.

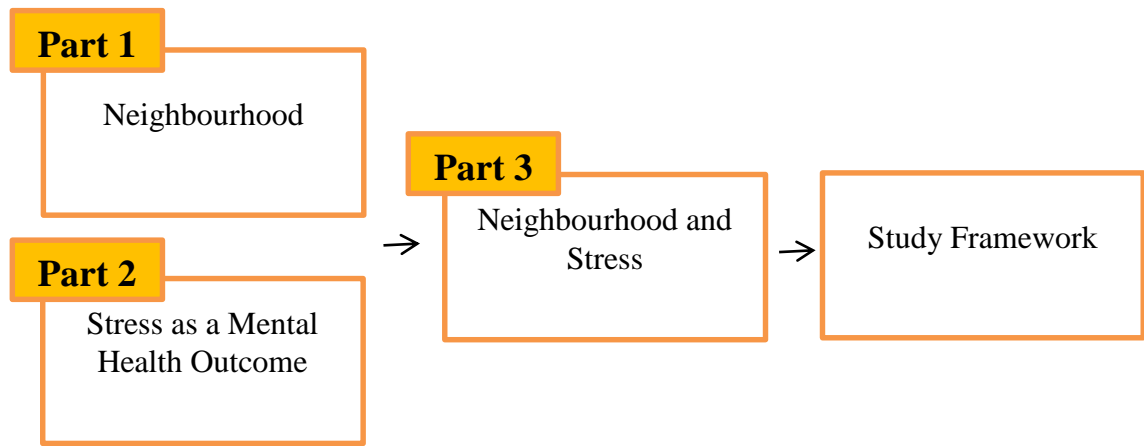


Figure 2.1: Flow of the literature review

2.1 Neighbourhoods and Neighbourhood Disorders

A *neighbourhood* generally defined as a living area and also a place to work, carrying social and economic activities such as visiting friends and shopping (Lebel, Pampalon & Villeneuve, 2007). The built environment and its social organisation can become familiar and could contribute to one's identity. A *neighbourhood* can thus become a reflection of oneself, one's values, aspirations and socioeconomic conditions (Kearns & Parkinson, 2001). It can also be freely selected or determined by these same socioeconomic conditions. Briefly, in general terms, a *neighbourhood* is a place characterized by a specific collection of spatially based features that can be found at a specific geographic scale (Lebel et al., 2007). In order to have a better understanding of what neighbourhood means, the term is further defined from its global and local context.

2.1.1 The residential neighbourhood in the global context

A point that should be mentioned here is that there is no globally accepted definition of the term, neighbourhood. Indeed, neighbourhood may be defined based on different categories including: (1) administratively i.e. by district or neighbourhood boundaries, (2) visually i.e. by distinct character or phase of development, (3) socially i.e. by the perceptions of the local residents, (4) functionally i.e. by areas allocated for local

services, and/or, (5) environmentally i.e. where the quality/safety of the living environment is of paramount importance (Barton, Grant & Guise, 2013, p. 28).

The United States Green Building Council's LEED-2009 defines a neighbourhood as "an area of dwellings, employment, retail, and civic places and their immediate environment that residents and/or employees identify with in terms of social and economic attitude, lifestyle, and institutions" (USGBC, 2009, p. xvi). This implies that neighbourhoods are identified as geographical areas. Neighbourhood boundary can be further determined based on the basis of the homogeneity of the population and the type of residence in which the people of the area live in (Weiss, Ompad, Galea & Vlahov, 2007). In addition to this, there are other limitations which can help the term to be better understood, for instance, the interaction between residents and the significance of these interactions can further determine the neighbourhood to be of a specific type. Over the years, the term neighbourhood is viewed to be subjective in nature as it encompasses various facets of geography thus, defining it can be a difficult task. Nonetheless, in order to be able to make the best and most efficient use of the quality and data available from the neighbourhoods, all these facets should be clearly identified and demarcated very efficiently (Weiss et al., 2007).

Neighbourhood boundaries are dynamic and a particular neighbourhood is controlled by geographical and social components. Perception of a boundary is based on personal experiences and external forces. Moreover, the way inhabitants consider their neighbourhood may also be derived from shared experiences. In a study by Coulton, Korbin, Chan & Su (2001) participants were given maps to draw the boundary of their neighbourhoods. Their boundary definition was based on their individual experiences.

There could be a shift in definition of neighbourhood boundaries based on specific aspects of neighbourhood (Hunter & Janowitz, 1974; Leventhal, Brooks-Gunn & Kamerman, 1997; Coulton, Korbin & Su, 2002; Elliott, Menard, Rankin, Elliott, Wilson & Huizinga, 2006). Consequently, neighbourhood boundaries cannot be defined strictly as these are also dependent on different factors such as social and environmental factors.

A study by Campbell, Henly, Elliott & Irwin (2009) found that there were four factors that could influence a person to define his/her neighbourhood boundaries. These four factors encompass (1) physical features of the neighbourhood, (2) the race, ethnic, and social class structure of the neighbourhood, (3) criminal fears that are perceived from inside and outside the neighbourhood, and (4) specific neighbourhood characteristics. All of these factors can affect how an individual comes to create a personal view of his/her neighbourhood boundaries.

Residents living within a specific residential area usually define neighbourhood based on their interactions with the other residents. Even they may recognize neighbourhood by the space surrounding them and their own observations of the geographical size of the place where they live. Thus, these perceptions may vary from the administrative boundaries or census tracks formed by local authorities. It appears that the factors which could limit the concept of a neighbourhood also include the size of the area and its functional relevance. These two factors mentioned above as being possible determinants of residents defining neighbourhood boundaries appear to differ with the other factors comprising physical setting, patterns of activity and socio-demographic characteristics. In order to gather information in a study by Voigtländer, Razum & Berger (2013), interviews were also conducted that could demonstrate how residents perceive neighbourhood boundaries.

It has been shown repeatedly that the concept of neighbourhood boundaries is loose because it can be defined widely. Neighbourhood is a subjective matter that can be based on social connections as well as the use of common facilities like schools, hospitals, shopping areas, etc. (Furstenberg & Hughes, 1997). The blocks are in the form of the main streets, but the residents' observations are based on factors like their daily interactions with the environment (Burton, Price-Spratlen & Spencer, 1997; Chaskin, 1997; Sastry, Pebley & Zonta, 2002). Based on the above explanation, it can thus be seen that in order to be able to study the effects of a neighbourhood, it is necessary to consider the individual resident's experiences of living within the residential area along with the official records of defined neighbourhood boundaries.

2.1.2 Using neighbourhoods in health studies

Previous studies looking at health issues have employed four different approaches which encompass studying the issue based on (a) national level, (b) city level, (c) neighbourhood level and (d) experimental. In order to dwell more in detail on neighbourhood as an approach, this section will attempt to highlight the different approaches briefly before providing the justification on why the neighbourhood-based approach is deemed to be more suitable for the current research.

2.1.2.1 National or multi-site approach

As has been mentioned earlier, the first approach employed in studying the health of individuals or families within the neighbourhood is through taking a national approach or what is also termed as multi-site study. This implies that researchers looking at neighbourhood and health collect their data from a national study. In this type of study, a wide range of socioeconomic status (SES) is taken into consideration. The approach focuses on the assessment of effects based on a limited number of person or families in

each neighbourhood. The types of data collected thus become the basis for the research conducted.

The National Longitudinal Survey of Adolescents and Children (Baker & Mott, 1989) or the Canadian National Longitudinal Survey of Children and Adolescents (Curtis, Dooley & Phipps, 2004) is an example of a study applying such an approach. The outcomes extracted from these studies show that lower-quality neighbourhoods are generally associated with poorer health outcomes for children. However, the problem here is that the collected data at national level are not suitable exactly to study neighbourhood impacts.

2.1.2.2 City-level approach

In this approach, data collected from cities or regions basically emphasize on neighbourhood effects within the city or metropolitan area. The Adolescent Pathway Project (Spencer, McDermott, Burton & Kochman, 1997) and the Woodlawn Longitudinal Study (Ensminger et al., 1996) are some examples using the approach mentioned. In their study, Spencer and his colleagues analysed the data from three different areas of New York, Baltimore, and Washington and they had ranked the neighbourhoods as high- and low-risk. Based on their findings, they concluded that living in high-risk neighbourhoods has an association with mental health outcomes. Another study done in Baltimore and Los Angeles County exemplifies a typical example of studies conducted on restricted neighbourhood (Entwisle, Alexander & Olson, 1994; Aneshensel & Sucoff, 1996). In the study, however, the school attendance served as the basis of data sets which also occur in many other regional studies, but not neighbourhood residence (Kupersmidt et al., 1995) or community based designs (Aneshensel & Sucoff, 1996). Due to this, it is therefore very significant to mention that neighbourhood influences had escaped the attention of such studies' sampling.

2.1.2.3 Neighbourhood-based approach

Apart from the two approaches mentioned above, it appears that the element of focussing on neighbourhoods had been less common (Baker & Mott, 1989; Curtis et al., 2004). In the neighbourhood-based approach, sampling of certain types of neighbourhoods and a variety of neighbourhoods are included so that the sampling represents some of the target population of the neighbourhoods. The number of individuals per neighbourhood in the sampling makes this different from the first two in terms of approach (Sampson, 1997; Earls & Buka, 2000). The Project on Human Development in Chicago Neighbourhoods (Sampson, 1997) can be considered as a good example which employs this approach. In it, the project mentions that it is necessary to define the neighbourhood clusters² with two to three tracts that were internally homogenous (with regards to the socioeconomic status, and ethnicity). Socioeconomic status and ethnicity were both used as variables but in different levels. For example, socioeconomic status was used at the three levels of low-, medium-, and high-income and under ethnicity, seven different levels were considered as variables (Earls & Buka, 2000). These variables were used to cross classify the neighbourhoods and a probable sample of eighty neighbourhood clusters that were stratified was used. Nearly fifty persons per neighbourhood cluster were called for interview in the said longitudinal study. The outcome of this research indicates that there is a possibility of measuring social control at the neighbourhood level. Furthermore, three distinguished dimensions of neighbourhood including poverty, race or ethnicity, and residential stability were used to assess the radical changes in the social control of children in the study.

² Neighbourhood Clusters refer to the neighbourhoods that have been classified into the same group by different factors such as socioeconomic status, ethnicity, and/or race.

2.1.2.4 Experimental approach

In the last approach termed as experimental, families within the neighbourhood were selected based on the requirement that they had resided in those specific neighbourhood types (Kling, Liebman & Katz, 2007). This approach may not seem very encouraging for residents, but housing policies such as those stated in the housing mobility programmes give researchers an opportunity to study the effects of a change within the neighbourhood which has an influence on the health of children and adolescents. In the housing mobility programme, the residents have been relocated from a neighbourhood that was poor to one that is economically better. In such programmes, there are both experimental and quasi-experimental projects being conducted because households are designated and assigned randomly by the scheme to relocate from their original place of stay. The programmes cannot select everyone who is interested in the programme or is eligible for relocation as it is based on the availability of housing vacancies. These types of projects are better suited to estimate the neighbourhood effects on health.

The Gautreaux Project is a good example illustrating this approach as it was the outcome of a lawsuit filed in the middle of the 1970s against the unfairness of the allocation of public housing in Chicago. The study conducted in public housing areas comprise poor residents with low income families who were mainly from African-American neighbourhoods. In this study, residents had volunteered for the programme and they were relocated to private housing areas where they were also provided support by Federal Housing Grants (FHG). The selected households shifted to many parts within town areas in Chicago that comprise mainly European-American and African-American neighbourhoods. In the suburban areas, the families were relocated to areas considered as affluent European-American neighbourhoods. Until 1990, families that had moved to the town and suburban areas had been randomly selected according to the availability of the

apartments and so the Gautreaux Project was considered as a quasi-experimental design (Rosenbaum & Popkin, 1991).

From the said project, some positive findings were detected and these helped specific randomised designed projects to be sponsored by the U.S. Department of Housing and Urban Development in five of the largest cities of the nation. Based on one of the three conditions explained in the following paragraphs “Moving to Opportunity” (MTO) authorities selected residents randomly if they belonged to the low income group and were minority families with children.

The conditions laid down were that experimental group with housing vouchers and financial help had asked to move to reside in a low-poverty neighbourhood which is defined as one where less than 10% of the households were deprived (as defined by the Census data, 1990). This kind of project was termed as experimental because since then, they had moved to wealthy neighbourhoods.

In the project, the second group was almost the same as the first group, i.e. it received housing vouchers but does not receive the financial assistance to move to the new living environment. This group was thus termed as the control group. It should be mentioned here that this group had the opportunity to move but not too rich neighbourhoods.

The last group was one which did not receive housing vouchers or financial assistance. Therefore, the group was called in-place control group as the people in the group did not move to any other places. Findings gathered from the quasi-experimental research focussing on neighbourhoods and health showed that there is a significant change among people who moved to suburban areas compared to those who did not. This change includes their job finding opportunities as well as their personal satisfactions. From the above studies which had come from different perspectives, it can be concluded that

neighbourhoods can affect the mental health and wellbeing of residents through different pathways. These studies appear to contain socio-psychological views. In that regard, the need to study mental health through the lens of urban planning so as to have a clear insight of its variations across different neighbourhoods becomes necessary.

2.1.3 Concept of neighbourhood disorders

2.1.3.1 Definition and origin

Fundamentally, neighbourhood disorders were derived from the criminology theory of social control where it was considered as law breaking (Skogan, 1990). There have been concerns about the definition of neighbourhood disorders since the period of the 2000s. Previous theory looking at neighbourhood disorders were more focused on the criminology parts. In traditional perspectives, when a neighbourhood is under complete disorder, it shows the disintegration of the society and the lack of or very poor control of social norms at the local level (Ross & Mirowsky, 2001). However, current definitions of neighbourhood disorders are not only related to criminology but also to the physical aspects of built environment. Some researchers divide neighbourhood disorders into two concept of social and physical disorders (Sampson & Raudenbush, 1999) where disorder is defined as a continuum between order and disorder and it demonstrates that disorder cues, whether physical or social, are statistically distinct.

Table 2.1 shows the origins of neighbourhood factors that was counted as a troubling event in the neighbourhoods in Malaysia and elsewhere. This table shows studies that have used these concepts or the related ones from the year 1980. The table also shows studies confirming that these items can cause most of the trouble in the neighbourhood. In the Malaysian context, there is one conspicuous factor which literature did not support, for example, drug use in public was not supported by any study in Malaysia. The following section aims to address this gap.

Table 2.1: Neighbourhood problems in the literature

No	Item	Other countries		Malaysia	
		Year	Author	Year	Author
1	Abandoned buildings, burned-out, Run-down building, vacant lots, poor maintenance	1980	Lewis & Maxfield	2009	Lateef
		1981	Lee	2011	Hussin & Omran
		1986	Taylor & Hale		
		1987	Gates & Rohe		
		1988	Rohe & Burby		
		1990	Skogan		
		1991	Covington & Taylor		
		1992	LaGrange, Ferraro & Supancic		
		1992	Perkins, Meeks & Taylor		
		1993	Taylor & Covington		
		1994	Rohe & Stegman		
		1999	Ross & Mirowsky		
2	Garbage Litter Trash Junk	1981	Lee	2006	Salleh & Yusof
		1986	Taylor & Hale	2013	Phang & Tan
		1987	Gates & Rohe		
		1990	Skogan		
		1991	Covington & Taylor		
		1992	Perkins et al.		
		1993	Taylor & Covington		
		1994	Rohe & Stegman		
3	Drug use	1980	Lewis & Maxfield	Not Supported	
		1986	Taylor & Hale		
		1988	Rohe & Burby		
		1990	Skogan		
		1991	Covington & Taylor		
		1993	Perkins et al.		
		1994	Rohe & Stegman		
		2002	Perkins & Taylor		
4	Loitering, teenagers hanging out on the street	1980	Lewis & Maxfield	2012	Chong et al.
		1990	Skogan	2012	Jabar, Razak, Wahid, Rahman & Paino
		1992	LaGrange et al.	2012	Shamsudin, Subramaniam & Ibrahim
		1992	Perkins et al.	2008	Elias & Mahyuddin
		1993	Taylor & Covington		
		1996	Perkins & Taylor		
		1999	Ross & Mirowsky		
5	Graffiti	1980	Lewis & Maxfield	2003	Chia & Stephen
		1991	Covington & Taylor	2010	Chohan, Che-Ani, Zubair & Waheed
		1992	LaGrange et al.	2010	Mujab & Munira
		1992	Perkins et al.		

		1993	Taylor & Covington		
		1999	Ross & Mirowsky		
6	Noise, noisy neighbours	1981	Lee	2010	Salleh & Badarulzaman
		1986	Taylor & Hale	2008	Salleh
		1987	Gates & Rohe		
		1999	Ross & Mirowsky		
		1992	LaGrange et al.		
7	Vandalism, broken window	1980	Lewis & Maxfield	2009	Malek & Mariapan
		1990	Skogan	2010	Chong et al.
		1992	Perkins et al.		
		1996	Perkins & Taylor		
		1999	Ross & Mirowsky		
8	Neglect of lawns and garbage by neighbours, bad neighbours, hassle by neighbour	1987	Gates & Rohe	2010	Leby & Hashim
		1999	Ross & Mirowsky		
		1992	LaGrange et al.		
9	Fighting, hassle, argues, mugging	1991	Covington & Taylor	2010	Leby & Hashim
		1994	Rohe & Stegman		
		1996	Perkins & Taylor		
10	Gangs	1988	Rohe & Burby	2012	Chong et al.
		1990	Skogan	2008	Elias & Mahyuddin
				2014	Fotios
11	Harassment	1992	Perkins et al.	2012	Sam, Zain & Saadatian
12	Inadequate police protection	1981	Lee	2008	Salleh
		1999	Ross & Mirowsky		
13	Stray dogs	1987	Gates & Rohe		Not supported
		1992	LaGrange et al.		
14	Landlords do not care, negligent slum-lords	1986	Taylor & Hale	2010	Ali, Kamaruzzaman, Sulaiman & Cheong Peng
		1987	Gates & Rohe		
15	Public drinking	1991	Covington & Taylor	1997	Jernigan & Indran
	Continued	1990	Skogan		
		1999	Ross & Mirowsky		
16	Crime	1981	Lee	2011	Cozens
		1999	Ross & Mirowsky		
17	Housing density	1993	Taylor & Covington	2010	Mohit, Ibrahim & Rashid
18	Burglary	1994	Rohe & Stegman	2009	Shah Habibullah & Baharom

In attempting to look at the definitions of neighbourhood disorders, it should be mentioned that since the beginning of the new millennium, there has been a growing concern regarding the exact definitions of neighbourhood disorders and Kubrin (2008) had specifically noted this issue of current definitions. Previous theoretical perspectives of neighbourhood disorders in the past thirty years had explained the definition well and particularly in the book, "Breaking Away from Broken Windows" (Taylor, 2001). It was explained that the concept concerns public "incivilities" that may attract crimes since neighbourhood disorders lead to the creation of potential criminals. These criminals are usually known as "invaders" from outside the neighbourhood who assume that residents are indifferent to what goes on inside their neighbourhood. Such an occurrence might happen even if the crime committed is relatively minor as in the case of broken windows, drinking on the streets, and graffiti. In the case of broken windows, the symbol can be apparently influential, bringing up strong visual images of the signs of disorder that serve as a sign of uncooperative residents who did not prevent strangers from entering the neighbourhood either by intervening the crime or call the police.

Many of the definitions of neighbourhood disorders seem to contain the idea that once a neighbourhood is disordered, it means that there is a loss of social control which then affects the residents and the neighbourhood circumstances as well. For example, presence of people fighting in the street, political messages or people selling illegal objects can stimulate unpleasant imageries. Skogan (1992, p. 71) defines high-level disorders within a neighbourhood as a factor that may lead people to withdraw from the community. Other researchers such as Sampson & Raudenbush (1999) divide neighbourhood disorders into two categories of social and physical disorders.

The notion of neighbourhood disorders including neighbourhood characteristics such as social inequality, poverty and neighbourhood movement patterns have been linked to social disorganization, social control, fear of crime, and neighbourhood decay (Foster &

Brooks-Gunn, 2012). Nonetheless, there is a distinction between crime and disorder both of which are overlapping concepts but in the definition of neighbourhood disorders, they are often deemed distinctively as such (Ross & Mirowsky, 1999; Sampson & Raudenbush, 1999).

Some sociologists recommend that definitions of neighbourhood disorder be contextualised for the reader. Cagney, Glass, Skarupski, Barnes, Schwartz & de Leon (2009) suggest that there is a difference between current definitions and traditional definitions of disorder. Neighbourhood disorders traditionally referred to crimes, but current definition counts physical setting (e.g., cigarettes on the sidewalk) as disorder as well. However, in looking at the definitions of neighbourhood disorders, Sampson (2009) also says that there is a bridge between past and current understanding of disorders. Therefore, to define the neighbourhood disorders is necessary to identified different kind of disorders.

2.1.3.2 Social disorders and quality of neighbourhoods

The factors mentioned above reveal that social disorders have an important role in determining the quality of neighbourhoods. In a living area that sites, many people into a neighbourhood, it is difficult to gauge how the individuals socialise and behave among others. Although it would be ideal to have a neighbourhood of people who show care, respect, and civic mindedness, reality indicates that people behave differently and some of these behaviours can be offensive to others. Thus when some of them do not exhibit a behaviour which majority would consider as civil, it could create an unrest which others may deem as a social disorder (Cutrona et al., 2006). The conditions of certain neighbourhoods and the activities conducted by the residents can be both small and big, criminal and noncriminal and when some among these people 'misbehaves' or do not adhere to some generally understood behaviour, their actions become perceived as social

disorders. When these incidents happen, they serve as indications for the residents to realise that social control may be collapsing (Taylor & Covington, 1993). In a nutshell, it can thus be deduced that the indications of social disorder occurring in a neighbourhood can encompass signs like (1) Fighting, (2) Loitering, (3) Drunken people, (4) Drinking in public, (5) illegal selling and (6) Groups hanging out causing trouble (Sampson & Raudenbush, 1999; Ross & Mirowsky, 2001).

Among other aspects of social disorder, one can notice too, young people like teenagers hanging out on the streets, signs of abandoned buildings which are in great need of repair, extreme noise, or excessive and unclear litter or grime. All these elements are not considered as criminal activities, but they are signals demonstrating the outbreak of social disorder (Bursik & Grasmick, 1993). An environment where control over the civil behaviour of residents has broken down could be considered as a negative environment which could become violent and such kinds of environment are often unpredictable. When a neighbourhood is perpetually engulfed by some form of social disorder, it raises a lot of mistrust among the residents living there and as the events happen even more, those residents can develop a phobia making them feel unsafe and they could even develop a feeling of being unable to trust their neighbours. It cannot be denied that good neighbours can help one another to maintain social security of their properties in the place where they live. In this regard, then the young people growing up in the environment as adolescents may also feel insecure. If they are not properly guided, these young ones may also become so vulnerable that they too succumb to the actions and behaviours of others who do not behave with civility (Taylor & Hale, 1986; Ross, Reynolds & Geis, 2000).

Besides what have been discussed above, a study by Sampson et al. (1997) indicate that there is a direct relationship existing between social control and the perception of threat. It appears that adolescents tend to keep away from the public life if they perceive that

they are personally threatened by a lack of social control in the neighbourhood where they live (Sampson & Raudenbush, 2004). Such kind of withdrawal only worsens the situation of the neighbourhood as then the community would not be able to develop a network that is good enough to enforce social norms since the public spaces are not filled by the necessary people (Skogan, 1990).

Wilson & Kelling (1982) noted that the failure of neighbours to protect each other during social disorder and the lack of foot traffic within a neighbourhood which is a protective system increases the possibility of the neighbourhood becoming targets for wrongdoing. Petty criminals may assume that they would not be caught for their disruption of social norms in such a chaotic neighbourhood and this then encourages more crimes to be committed. It appears that criminals choose places that are not orderly and not well organized to commit their crimes as such places do not have a bond among the residents who would look out for each other. These troublemakers who come from other places then feel free to behave as they please as there is no one to keep them under control. In contrast, when there is control over the social behaviour and norms of a neighbourhood, there is more order as it works as a feedback system for the society to understand the situation of the crime and criminal activities. Such places deemed to be safer would attract more people to relocate especially if they can afford to live in such neighbourhoods. In neighbourhoods that are constantly contending with social disorder, it is often those who could not afford the resources that would stay behind (Sampson & Raudenbush, 1999).

Due to the continuous psychological impact like fear, threat and isolation experienced by adolescents who experience social disorder in the neighbourhood where they live, adolescents have been found to be suffering chronic stress (Latkin & Curry, 2003). In addition, it was found that two factors which can cause chronic stress which then indirectly makes the adolescents victims of the disorder are the threat of the insecurity

and the break in the social network. The more this deepens, the more they develop a lack of trust in their neighbours. It cannot be denied that as the younger generation, adolescents face and experience harassments on a daily basis and this too can contribute to their suffering chronic stress (Ross & Mirowsky, 2001). It can be said that when there is no public support to stop the social disorder from further disintegrating the social norms, individuals would feel cut off, angry and discouraged (Burdette & Hill, 2008). Hence, when an individual becomes socially isolated chronic stress sets in and this occurs especially in settings that are spatially grounded (Berkman, Glass, Brissette & Seeman, 2000).

In the past a number of researches have proven that social disorder leads to a variety of health issues which are part of chronic stress. According to Aneshensel & Sucoff (1996) neighbourhood disorder, also termed as “ambient threat”, is linked to mental health issues among adolescents but it excludes it as an individual predictor of mental health. In a study, Ross (2000) found a similar relationship between neighbourhood disorder and depression among adults. Ross (2000) also found that the disorder acts completely as a mediator between neighbourhood socioeconomic disadvantage and depression. In another research, looking at major depression and the neighbourhood environment, Kim (2008) showed that there is an association between neighbourhood social disorder and major depression in general. Likewise, Burdette & Hill (2008) who looked at perceived neighbourhood disorder found that the cause of obesity in adults was due to psychological or chronic stress. Ross & Mirowsky (2001) also explicitly tested a theoretical model and they found that the relationship between neighbourhood socioeconomic disadvantage and general health status is caused by perceived fear and also due to psychological stress experienced because of neighbourhood disorder.

From the above discussion looking at neighbourhood disorder, it can be said that there is a link between mental health issues and neighbourhood disorder. It has also been proven by studies that adolescents suffer from chronic stress due to perceived neighbourhood disorder which in turn, can make the adolescents feel isolated. Some studies have also shown that there is an association between neighbourhood socioeconomic disadvantage and the general health of the individual, apart from the mental health issues that had been researched by others. All in all, it can be concluded that if the neighbourhood maintains a good set of law and order system, then the younger generation such as children and adolescents will not need to experience any form of mental or physical health problems. For such an environment to prevail, there need to be a very good partnership between public departments in the government and private individual's living in residential areas as both of them are part of the same society.

2.1.3.3 Physical disorders and quality of neighbourhood

A number of research has been done to study social epidemiology and these studies indicate that chronic stress in residents can be related to the physical disorders in the neighbourhood (Latkin & Curry, 2003; Hill, Ross & Angel, 2005). People who live in such areas face a lot of stress and chronic stress can cause health issues to intensify for instance blood pressure, depression, heart problems and obesity (Flier, Underhill & McEwen, 1998; Sampson & Raudenbush, 1999; Ross & Mirowsky, 2001; Hill et al., 2005).

In the American project 'Moving to Opportunity' mentioned earlier, it appears that selected residents from subsidised housing were shifted to middle class neighbourhoods. One study conducted randomly by Kling, Ludwig & Katz (2005) indicate that there was significant improvement in the mental health and feelings of security among the adults and young women when compared to the residents who continued residing in the

subsidised housing. However, in this study the effects of physical disorder were not thoroughly investigated.

In another study, Ross & Mirowsky (2001) discovered that the higher the physical disorder of the neighbourhood, the worse the health status of the residents and this limited the physical functioning of the residents when compared to residents of a cleaner area. The study provided evidence to show that stress due to fear of crime and violence can induce health issues because of the physical disorder of the neighbourhood. As this study is dependent on self-reported disorders as well as self-reported fears and health, there were some questions raised with regard to the causal order of the variables used. This is because other studies had shown that a lack in civil behaviour and social control over neighbourhood problems can also cause neighbourhood disorders (Garofalo & Laub, 1978; Lewis & Maxfield, 1980; Lewis & Salem, 1986; Moore & Trojanowicz, 1988; Rohe & Burby, 1988).

2.1.4 Possible impact of neighbourhood disorders

In the “broken windows” theory developed in the 1980s, there was evidence to suggest that crime rates have been affected by the physical disorder as well as social disorder of a neighbourhood (Wilson & Kelling, 1982). For the purpose of elaboration, the following section will aim to throw some light on these disorders. First, when a residential place exhibits some form of physical disorder such as those explained above, the image clearly suggests that the residents had tolerated such atrocities which had broken the social norms of a neighbourhood. The prolonged session of the disorder implies that the residents had not taken any step to interfere with helping to maintain the social order. Consequently, the laid back attitude encourages potential criminals to act further since the said neighbourhood disorder suggests either a poor control or totally no social control. Second, the elements that are responsible for causing the disorder in the neighbourhood become

threats to the residents and the more the residents feel threatened by for example, drunken people or smoking crowds, they tend to retreat further into the safety of their homes. This behaviour does not help the neighbourhood in developing good relationships between neighbours and residents (Wilson & Kelling, 1982; Skogan, 1990). Such a situation can result in fewer people spending time in public places and this more or less encourages the disorderliness to increase. The introduction of “The eyes on the street” has become an important mechanism among neighbourhoods to curb the disintegration of social disorders in large cities (Skogan, 1990; Jacobs, 2010). However, using such control would not be enough. It is therefore very important that residents know each other well and build a good relationship so that they can better act together to maintain law and order in their neighbourhood and this, in turn, gives the feeling of security for all concerned (Sampson & Raudenbush, 1999).

In this regard, it can be seen that once residents are aware of the community feeling among themselves, they are more likely to raise their voice against any negative element which is responsible for causing the disorder in the neighbourhood. As a result of this common come togetherness, crime rate can be reduced (Ross & Jang, 2000) otherwise, the situation would only worsen especially with less security and more fear. Both these factors working simultaneously can lead to mental stress for all concerned. For instance, when crime rate went up in the New Jersey, U.S, the Governor of the state decided to improve the safety of the neighbourhoods through introducing the foot patrolling system. When this occurred, the local police were very doubtful that it would be effective (Kelling, 1996, p. 96) and they were not keen on this system because such activity requires people to be physically present on the streets regardless of whether the weather was warm or cold. In that exercise, the crime rate did not go down but it made the residents felt more secure as certain elements like rowdies, prostitutes, drunks, addicts and so on

who were not actually criminals, were no longer seen to be loitering in the neighbourhood and bothering people unnecessarily (Ratcliffe, Taniguchi, Groff & Wood, 2011).

The outcome of this exercise showed that the residents also began to have a better opinion of the local police force due to their regular interactions with the beat police. In addition, the findings of this exercise were taken as evidence to show that foot patrolling did not reduce the crime rate. Conversely, the exercise enabled the police to create a rapport with the public and to understand the public better. In this exercise, it was clear that the feeling of anxiety and fear among residents had actually stemmed from the disorderliness of the neighbourhood rather than from violent crimes in the area. Simultaneously, this exercise indicated that the mental health of residents had improved due to the sense of security provided by the beat police.

This exercise also proved that at the community level, there is a relationship between disorder and crime. According to some social psychologists and authorities of law, a “broken window” which is not attended to immediately is a sign that there is no one to question those who break the window or that the law is not serious (Wilson & Kelling, 1982). Both these features are also signs that there is no orderliness in the area. IN contrast, when there is a sign of police patrolling in their neighbourhood, residents develop this sense of security because there is someone with the authority to approach and report to. This therefore gives residents a sense of importance as they feel that they have done something for the society and so the feeling of a community evolves. In general, residents are afraid of being seen by the criminals when they approach a police patrol car whereas when they talk to a police officer in private, they tend to feel more secure due to the anonymity. With the presence of police patrolling the neighbourhood, gangs do not have the opportunity to stand around and threaten the residents. Gang and criminal elements can weaken the community as residents feel threatened by their

vulnerability and so a sense of fear spreads. However, if this sense of vulnerability can be arrested by the very presence of the police, it would suggest that the police are easily approachable for the public, thereby breaking the myth that the police are unhelpful or arrogant.

In conclusion, it can be said that the “broken window” theory indicates zero-tolerance by the police for disorder in any neighbourhood. Neighbourhood disorder is a haven for criminal elements as they can go on with their activities undetected and if law and order is implemented in such a place by the police, it not only increases the feeling of security among residents, it can counter act on the residents who now will feel less apprehensive in putting in more efforts to care for their community. This behaviour will automatically lead to orderliness and so potential criminals will not be able to commit any criminal activities in these places. According to the “broken window” theory, the police alone are not responsible for bringing about order in a neighbourhood, it takes the whole neighbourhood of residents and citizens of the community to be equally responsible to stay vigilant and protect their neighbourhood. Though orderliness is the joint responsibility of residents and the police, it appears that the police would have a higher role to play than the citizens. This is because, residents of the neighbourhood can be taken into confidence by the police to gather information about strangers who loiter around their neighbourhood and who could be potential criminals. This cooperation can help to reduce crime rate thereby neighbourhood disorders.

The above section has illustrated the importance of understanding neighbourhood disorders. It was also indicated that loss of orders in any neighbourhoods can result in harmful effects which sometimes, cause irreparable experiences for residents. The following section aims to explain two major components of neighbourhood disorders which include social and physical disorders.

2.1.4.1 Perceptions of neighbourhood disorders

Neighbourhood disorders are perceived based on some clear signals that show the disorder and the lack of social control in the area. Order exists in any place where there is a strong presence of peace, safety, cohesion and good law and order. An orderly place would be clean and safe with very little noise to disturb the neighbourhood. Buildings in such neighbourhoods are well maintained and residents cooperate with each other which automatically brings down the crime rate and young people in a typical orderly neighbourhood are usually busy with their work.

To understand how young people like adolescents view the neighbourhood characteristics and understand what neighbourhood disorders entail, one must understand the significance of both these factors which are very important for a study on neighbourhood (Bronfenbrenner, 1986; Jessor, 1992, 1993; Aneshensel & Sucoff, 1996; O'Neil, Parke & McDowell, 2001). It has been shown that census blocks are more common than the perception of the neighbourhood, but these perceptions are very consistent and they are considered to be authentic measures of the community (Aneshensel & Sucoff, 1996; Hadley-Ives, Stiffman, Elze, Johnson & Dore, 2000; Ewart & Suchday, 2002). Studies have shown that neighbourhood context and adolescent mental health are inter-related with regard to perceived neighbourhood context showing very good insight than the end result of objective measures (Hadley-Ives et al., 2000).

At the neighbourhood level, adolescents are capable of observing the order and control or the lack of it in their neighbourhood via obvious signals, some of which have been discussed above. The signs of the disorder could be social, physical or environmental (Taylor & Hale, 1986; Skogan, 1990; Wei, Hipwell, Pardini, Beyers & Loeber, 2005). In this research, only the social and physical neighbourhood-level of disorders are emphasized as has been explained earlier.

Several significant publications have considered possible ways of looking at the association between perceived neighbourhood disorders and mental health status in developed countries like the US and UK (Aneshensel & Sucoff, 1996; Wandersman & Nation, 1998; Ross & Mirowsky, 2001; Mirowsky & Ross, 2003). Based on the available literature and relevant empirical evidence, a model was developed to show the link between factors in the neighbourhood and stress among adolescents in Kuala Lumpur, Malaysia. This model illustrated the direct and indirect experience of neighbourhood perception and several classes of secondary mechanisms which will be further explained in the following chapters.

2.1.4.2 Experiences of neighbourhood disorders

There is no doubt that a person's environmental experience may affect his/her behaviours whether positively or negatively (Kaplan, 1985). An expectation model would concentrate less on data linkages but more on the perceptions of the possible success in taking opportunities. Neighbourhood expectations might be linked to personal experiences and in this case, it can be defined by some of the epidemic models (Buckner, Beardslee & Bassuk, 2004).

According to Buckner et al. (2004), the experience of those who have always lived "in the community" is limited. However, in the developmental psychology literature the importance of an inclusive experience of a community for young people is highlighted. In the everyday experience of a neighbourhood, members such as shopkeepers or even ordinary members may provide the larger context where positive interactions occur with parents, family, teachers, and peers (Bronfenbrenner, 1986; Brooks-Gunn, Duncan, Klebanov & Sealand, 1993). Such supportive experiences can increase the probability of adolescents maintaining a positive feeling about themselves and developing social

attitudes and personal capabilities that can spread beyond the close and protected environments into the open and bigger community.

As has been mentioned before, neighbourhood influence can occur in different ways. The person who can perceive the disorder in his/her neighbourhood environment may not necessarily have that experience. For example, if a common social problem like arguing with a neighbour, or a major crime like robbery happening in one neighbourhood spreads within the neighbourhood, then very likely residents living in the same area may develop a fear of the same incident happening. Since, there would be difference between experiences and perceptions; therefore, assessing both the experience and perceptions would require the researcher to find out more about the neighbourhood disorders and its contribution to mental health.

The focus of the first part of chapter two was to define the concept of neighbourhoods, neighbourhood disorders, types of neighbourhood disorders, and possible outcomes of neighbourhood disorders. The first part was allocated to explaining the concept of neighbourhood in a global and local context. This was followed by the reason why the dimension of neighbourhoods would serve as the best approach in studying neighbourhood's contributions to residents' mental health and wellbeing.

The second part of chapter explains two different types of neighbourhood disorders encompassing social and physical disorders. Indeed, social disorder and physical disorder are under the same concept but each has different characteristics. In the case of Malaysia, the dimension of loitering, group ganging, drinking, drunken people, and fighting have been introduced as factors of neighbourhood social disorders. Graffiti, vandalism, abandoned cars, vacant building, and garbage/litter were also identified as physical disorders. These items were extracted from previous literatures which were then used to support the local context. Towards the end, possible outcomes of neighbourhood

disorders including its experience and perceptions were then explained. This part helps to cast light on the distinction between the experience and perception held of neighbourhood disorders.

2.2 Stress as a Mental Health Outcome

2.2.1 Understanding stress

The word “stress”, as it is now utilized was authored by Hans Selye in 1936, who was also known as the “father of stress”. Selye characterized stress as “the non-specific response of the body to any demand for change” (Selye, 1956). Selye had also noted in various investigations that animals in the laboratory experience severe, but a different kind of harmful physical and emotional inducements. For example, blaring light, deafening noise, extremes of heat or cold, perpetual frustration, stomach ulcerations, lymphoid tissue shrinkage, and adrenals enlargements are what laboratory animals experience as stress. Selye then later showed that continuous stress is the reason of growing diseases in these animals. Likewise, when human experience stress, they too go through motions including heart attacks, kidney failure, arthritis, stroke and so on. Selye then suggested that the different diseases suffered by animals can also cause human beings to suffer from the same ailments. In addition, it should be mentioned that stress is a state that one is in, and in reality there is a difference between stress and stressors that is, the source of stress.

According to Stevens, Loudon, Yow, Bowden & Humphrey (2013), there are some general classifications of stress that will be discussed in the following section including (a) desirable and undesirable stress, (b) physical stress, (c) psychological stress, and (d) social stress.

2.2.1.1 Desirable and Undesirable Stress

The stressful life events in this study included both types of desirable and undesirable stress, since continuous experiences of the both types may change the health status of a person. The classic comment of Selye (1956) which states that “stress is the spice of life” divides stress into two different opposite categories of desirable and undesirable, invigorating and motivating as well as debilitating. This means that if a person wants to avoid stress he/she may never attempt to achieve anything. Therefore, certain kinds of activities even if they have beneficial effects, may cause stress. Certainly, the human body needs to be exercised and even challenged in order to function well, and it is a well-known fact in physiological science that muscles will soon waste away if there are no physical activities involved.

In the literature, undesirable stress may be referred to as distress and Selye (1956) for example, refers to the pleasant or healthy kind of stress as *eustress*, and to the unpleasant or unhealthy kind of stress as distress. When stress becomes prolonged and unrelenting it thus becomes chronic and this can result in very serious health issues for the individual.

Although both “good” and “bad” stress place specific demands for resources on the body, it does not mean that good stress is “safe” and bad stress is “dangerous”. Two prominent psychologists explored the idea of whether “good” stress is safe and “bad” stress is dangerous and they made some interesting suggestions in this regard. The two important variables that play a pivotal role are predictability and controllability (Posner & Leitner (1981). This can be due to the reason that predictable pain and discomfort are less harmful because the person experiencing the pain comes to the learning position that once he/she is relaxed, then his/her guard against the stress is less. Since periods of impending pain are signalled, the person can safely relax at times when the warning signal is absent.

It seems that the duration of psychological safety can protect the person from any harmful effects of stress. Persons receiving any un-signalled pain would not have any way of knowing when it is safe to relax. Consequently, they are more likely to develop serious health problems due to constant pressure of chronic psychological stress.

Other psychological variables that may have an important role to play in determining the stress level's effects is the controls of environmental stress. This factor is more related to the coping behaviours of an individual and how he/she deals with the stressful environment. An individual's ability to control painful events may, to some degree, insulates him/her from experiencing the damaging effects of stress. However, it can be said that the coping behaviour of the individual can only be successful in avoiding the stressful environment if he/she can provide a feedback signal. Any action which does not contain this heartening feedback in any active coping behaviour may increase the stress effects since it depends heavily on the energy reserves of the respective body (and emotions) and when this happens, the individual may be left in a state of chronic stress.

Research looking at the predictability and controllability of stressful activities has remarkably helped people to find out more about the purpose of participating in stressful and challenging events. The possibility of this kind of stress causing harm seems less as the stress level is under control. In contrast, when essentially similar body reaction is produced by "bad" stress (stress that has neither predictability nor controllability and produces predominantly negative outcomes) then stress-related illnesses will result.

Perhaps "good" stress does not produce illnesses because typically, the events linked to "good" stress are scheduled in advance. This means that the end results of such events are predictable, or that they are under the control of the person. However, even activities that are generally considered to be pleasant and exciting where "good" stress is expected, it can lead to illnesses if the individual is not forewarned or if he/she has little or no control

over the events. In a nutshell, it can be said that undesirable stress or bad stress may harm the body as well as the life of the individual mainly because they are unpredictable and not under control.

In tying the discussion about stress, it can thus be said that some people tend to take the middle ground on this subject to avoid trouble. For instance, if someone is asked about stress, he/she may answer that it is neither good nor bad and this is interpreted as meaning that harmful effect of stress is not defined by the stress, even if it can be perceived and determined by the individuals. In other words, one either handles stress effectively or one allows stress to influence the person negatively and ultimately become victims of undesirable outcomes.

2.2.1.2 Physical Stress

In discussing physical stress, it is apt to note that there is a difference between the physical and physiological. The former should be considered a broad term. It can be described as “pertaining to or relating to the body”. The latter term is concerned with “how the organs of the body relate to one another”. Through this distinction, one can notice that physical stress could be related to unusual and excessive physical exertion as well as by certain physiological conditions brought on by some kind of stress. Physical stress can be divided into different categories including emergency stress and continuing stress. Since, the focus of current study is on the mental health outcomes, therefore, physical stress has not included in this research.

To expand on the discussion, physiological reactions take place during an emergency stress as has been previously described. For example, when the body is injured, the hormones discharge into the bloodstream. The heart rate rises and there is enlargements

of the blood vessels in the muscles and all these happen to prepare for the immediate energy that is required.

In looking at continuous stress, the picture indicates that the reaction of the body is more complicated. Here the physiological contribution is the same but more hormones continue to be discharged and the purpose is to increase body resistance. In cases where the stress is extreme, a third stage of producing may cause exhaustion of the adrenal glands such that sometimes it could result in the culmination of the individual's physical and/or mental deterioration.

2.2.1.3 Psychological Stress

With the definitions of physical stress provided above, it can be said that the main difference between psychological stress and physical stress is that physical stress is more concerned with real situations whereas psychological stress is more concerned with the imaginations and illustrations. As an illustration, imagination about the various stressful situations might be enough to cause muscles in one's body to tense up and this also leads to a rise in heart rate. It is believed that even psychological stress can affect and influence the level of the individual's mental health. Consequently, such issues can lead to the deterioration of the individual's health and wellbeing and eventually his/her entire life as well. In this regard, it should be mentioned that in general, both physical stress and psychological stress may affect life-span independently through their respective fields. However, efforts are being made to integrate these two conceptions for the purpose of emphasizing the continuity between physiological and psychological theory.

2.2.1.4 Social Stress

Human beings are natural creatures of socialisation and so many of them need to live in such a way where there is an abundant form of social interactions. Human beings need to work, play, do some form of activities together with other people. Each individual is a small part of a society such that without him/her, society is meaningless. In the current daily life of a society, there are both actions and reaction for each of these individuals. Indeed, these actions and reactions are inevitable for the social beings. As each interacts with the others, there are bound to be some form of stress being experienced. Stress can be experienced by these individuals via the shifting of social and value paradigms, financial crisis, and certain other social issues.

In addition, where a society lives together, there are also bound to be bad feelings and hostility being experienced among the groups or individual and these factors can lead to some display of negative attitudes brought on by possibly failures, or ineffective social relationships. Likewise, an impartial or relaxed attitude of the individual can also cause indifferent tolerance and as such the behaviour can influence the others such that it debilitates the society. Indeed, the attitude of “I don’t care” could be a signal of stress, and intolerable life events for the individual. However, as a final analysis, stress is prevalent and perpetual; this it is the people themselves who hold the key to the avoidance of undesirable social stress in any kind of environment.

2.2.1.5 Causes of Stress

When reviewing the causes of stress, a fair and reasonable question might be: What *doesn't* cause stress? This rhetoric is mentioned because most human environment as well as society as a whole are now seen as stress-inducing to some degree. In recent years, there have been more report of various types of cancer and it seems as though “almost

everything causes cancer.” Perhaps the same can be said about stress because the notion of stress seems to have escalated and reached “epidemic” proportions. Many people including those at the layman level seem to think that “almost everything causes stress”. In recent years, analysts have contemplated that certain life occasions are some of the reasons that causes stress. Through the use of instruments which measure life-events, researchers endeavoured to discover what sort of issues are connected with different occasions, whether normal or abnormal, that can happen to an individual. It appears that such issues may happen in their normal life or as an aftermath of mistakes.

In the case of young people, it cannot be denied that even children experience stress and this is more so among those aged between ten and nineteen. Research like Haggerty, Sherrod, Garnezy & Rutter (1994) is being carried out in order to help children cope with stress, which is viewed as an internal pressure that affects the child’s health and wellbeing. Here, stress is defined as a condition that damages the psychological or physiological dimensions of a person (Cohen, Kessler & Gordon, 1995). Child psychologists mention that stress can also be a stimulator, a response or an event-reaction to relationships. When stress behaves as a stimulus, it is an independent variable that disturbs the adolescent. This refers to the exposure to circumstances or events which are external forces affecting the individual.

Stressors have the power to dictate the circumstances and are capable of making changes in the physiological and psychological balance of the individual. As a stimulus, stressors can be either classified as vital events, chronic events or everyday events. When the individual is exposed to exceptional, traumatic, unpredictable and uncontrollable situations that bring about very relevant changes in the person’s life and demanding certain adaptive readjustments, such events are then termed as vital events.

Stressors that are long lasting are called chronic stressors and they tend to harden the physical and social aspects of the environment, which, as a consequence, have a series of difficulties and disadvantages which can bring about continuous threats and changes for the individual. An example of chronic stress is suffering from a chronic illness or being exposed to high levels of noise pollution in the environment.

When the child goes through the daily dealings with his/her surroundings, the child may also go through some frustrating or irritating moments and this is considered as stress that occurs as an everyday event. The emotional and physical happiness of the child is completely changed due to various incidences such as problems, worries and setbacks which can be quite frequent and may even have a very high intensity. Such levels of stress cannot be easily predicted.

Researchers (Barnes, Bauza & Treiber, 2003) have provided evidence to show that when adolescents experience stress on a daily basis, it can affect their overall health and psychology throughout their adolescence. It has also shown that adolescents who are stressed on a daily basis also become emotionally affected (Compas, Davis, Forsythe & Wagner, 1987). Thus, the emotional development of such adolescents may be at risk.

2.2.2 Stress in adolescents

It is believed that stress can affect groups of adolescents and the following section aims to allocate some definition of adolescents and stress in adolescence.

2.2.2.1 Adolescents

As is the case of human beings, some groups of people, in particular adolescents are more vulnerable than others to the effect of stress. According to the World Health Organization (WHO) adolescence is defined as the age between ten and nineteen years and this can be further subdivided into three groups, i.e. early (10-14 years) adolescence, which is the

focus of this research, middle (15-17 years) adolescence and late (18-19 years) adolescence (WHO, 2014). The definition of adolescence provided here is similar to the definition offered by the United Nations Population Fund (UNFPA) and the United Nations International Children's Emergency Fund (UNICEF) (UNICEF, 2001). Adolescence is also the interim stage between childhood and adulthood when the child's dependence on the family reduces and he/she begins to function independently. In this regard, it is natural to assume that adolescence could sometimes be stretched into the late twenties or even early thirties in some regions (UNDESA, 2004). Though there is no specific definition for the term 'adolescent' there are many common characteristics that set the notion apart from others.

As mentioned earlier, there is no universally agreed definition for adolescence, but there are some commonalities among the definitions offered by the various international agencies. Addressing the health issues of adolescents has become a great concern globally and a number of agencies throughout the world, comprising both private and government, are involved in this exercise. In Malaysia especially, there are a number of ministries and departments that tackle the health issues of adolescents and they include the Ministry of Health, Ministry of Education, Ministry of Adolescents and Sports, Ministry of Women, Family and Community Development, Malaysian Islamic Development Department, Federation of Family Planning Association Malaysia, Malaysian Medical Association, Malaysian Association for Adolescent Health, Malaysian Mental Health Association and Malaysian AIDS Council. All these agencies are major agencies that collect data and information about the health of adolescents in Malaysia (Ministry of Health, 2007).

An adolescent's life is dependent on his/her family and studies indicate that there are sociological and biological factors that can likewise affect the adolescent's life. These factors can have a direct impact on them, their family, school, peers, the community in

which they live and the environment they are surrounded by Ministry of Health (2007). In this regard, a good and a bad environment can cause great consequences. The sociological context says that many individuals basically adults surround the adolescent and many of them can be considered as related to the adolescents. These individuals could be the parent or guardian who is considered as a “member of the family” or it could be a member of the extended family or just about any person residing in the same household as the adolescent. In another context, the adults surrounding the adolescent comes in the form of “foster parent” which specifies that the person is not a parent or a relative of a child but a guardian (a) to whom the care, custody and control of an adolescent has been given by order of a Court or (b) permitted by the Protector (UNICEF, 2001). In the study of adolescents, interactions occurring between these adults and the adolescents have been researched and findings indicate that there are both positive and negative impacts on the adolescent when context and situation are taken into view.

2.2.2.2 Adolescents’ stress

Among the Malaysian population, a number of research has been conducted to identify the association between adolescents’ stress and health (Rahmah & Shahrniza, 2008; Esfandiyari et al., 2009). Findings indicate that these can be related to stressful life occurrences such as inevitable changes including physical changes, school performances, sexuality matters, as well as interactions with teachers and friends. Nonetheless, physical changes which are also termed as normative stressors and other related stressors to set a sense of identity may happen for some of the adolescents (Hankin, Roberts & Gotlib, 1997; Steinberg, 2008) and when this occurs, stress is experienced.

In addition, life events and environmental circumstances can also burden adolescents. These so called normative stressors can be attributed to the family, school, peers and the community at large. Even unexpected negative life events such as illnesses or injuries can

put a lot of stress on adolescents. Based on this, there is no doubt that the experience of their daily hassles including minor stressors can be damaging and hazardous for some adolescents (Guthrie, Young, Boyd & Kintner, 2001).

It has been shown that most of the daily and stressful events experienced by adolescents are related to the interactions that lead to conflicts within the family or among friend groups as well as romantic relationships (Anders & Tucker, 2000; Bowker, M. Bukowski, Hymel & K. Sippola, 2000; Harvey & Byrd, 2000; Seiffge-Krenke, Weidemann, Fentner, Aegenheister & Poeb lau, 2001; Halpern, Oslak, Young, Martin & Kupper, 2001; Furman, 2002). However, these results might be changed in different culture. In this study the most and least stressful factors among adolescents would be introduced.

These various stressors including physical or psychological stressors can influence the way adolescents think, feel, or behave (Steinberg, 2008) and consequently, they can affect the mental and physical health (Morales, 2000) of these adolescents. The damaging effects are more visible once there is a lack of coping resources hence it is necessary that adolescents learn to acquire some mechanisms to help them cope with overcoming the stressors (Ang & Huan, 2006).

2.2.3 Measuring stress in adolescents

There is a large body of literature assessing stress in adolescents at both the global and local contexts (Sulaiman, Hassan, M Sopian & Abdullah, 2009; Wong & Othman, 2010; Yusoff, Rahim & Yaacob, 2010; Hashim, Golok & Ali, 2011; Evans, Greaves-Lord, Euser, Tulen, Franken & Huizink, 2013). The following are some brief explanations discussing the different approaches these studies have used. At the end of this section, the selected tools applied for the current research and the reason why the tools are deemed to be the best option, and the variables employed are explained. Table 2.2 illustrates the studies drawn from different countries which assess stress among adolescents. In the case

of Malaysia, it appears that most of the studies use Perceived Stress Scale (PSS) or Depression Anxiety Stress Scale (DASS) to measure the stress level of the adolescents. For the benefit of this research, it is apt to mention how these tools used, had been basically designed for adults and in that regard, may carry some unsuitability when used on adolescents.

Table 2.2: Different tools to measure the stress

No	Instrument to measure adolescents stress	Place	Year	Authors
1	SAFE Acculturative Stress Measure	US	1996	Hovey & King
2	Responses to Stress Questionnaire (RSQ)	US	2000	Connor-Smith, Compas, Wadsworth, Thomsen & Saltzman
3	Perceived Stress Scale (PSS)	UK	2003	Cartwright, Wardle, Steggle, Simon, Croker & Jarvis
4	Perceived Stress Scale (PSS)	US	2005	Goodman, McEwen, Dolan, Schafer-Kalkhoff & Adler
5	Adolescents Stress Questionnaire (ASQ)	AU	2007	Byrne et al.
6	Daily Life Stressors Scale (DLSS)	US	2007	Lin et al.
7	Perceived Stress Scale (PSS)	MY	2009	Yaacob et al.
8	Students-Life Stress Inventory (SSI)	MY	2009	Sulaiman et al.
9	Secondary School Stressors Questionnaire (3SQ)	MY	2011	Yusoff, Liew, et al.
10	Depression Anxiety Stress Scale (DASS)	MY	2011	Hashim et al.
11	Everyday Stressors	MY	2011	Noor & Alwi
12	Perceived Stress Scale (PSS)	India	2013	Thaker & Verma
13	Perceived Stress Scale (PSS)	China	2014	Hsieh et al.
14	Depression Anxiety Stress Scale (DASS)	MY	2014	Yusoff, Saari, Naidu, Ahmad, Omar & Aris

It is necessary to mention here that Depression Anxiety Stress Scale (DASS) is a tool used to measure not only the stress but also other mental health outcomes such as anxiety and depression. Among these tools that have been illustrated in Table 2.3, the Adolescents Stress Questionnaire designed by Byrne, Davenport & Mazanov (2007) assesses stress

among adolescents. This instrument has been tested and validated for both the Australian and European populations (Byrne et al., 2007). In the current research which focuses on Malaysia, a pre-test was conducted in order to consider each item separately and to ensure that the questionnaire can be validated for the Malaysian population as well.

The second part of chapter two has explained the various categories of stress encompassing desirable, undesirable, social, physical, and psychological stress. This portion of Chapter Two has made reference to the effect of stress in adolescents and how it may affect their health including their behaviours. In addition, a discussion of the different methods of measuring stress-level in adolescents was provided and justification was also indicated to explain the selection of tool used for the current research. Some explanation on the Adolescents Stress Questionnaire was given and the 10 scale items include home, school performance, school attendance, relationships, dealing with adults, teacher, peer, parents, finances, and future issues. Each of these scales will be mentioned along with the items in the Chapter Three.

2.3 Neighbourhood Disorder and Adolescents' Stress

Investigations of health condition based on neighbourhood boundaries date back nearly a century ago (Pfeiffer et al., 1917). In their study, Pfeiffer and his colleagues assessed different types of diseases among residents in the Chelsea neighbourhoods of New York. They found that the risk of some of these diseases was higher in that neighbourhood. Nonetheless, their main concentration was on the prevalence of the diseases rather than the effects on neighbourhoods. This research can be considered as one the earlier studies that focus on neighbourhood boundary but the context of the study was on diseases.

It was later that studies began looking at the association between neighbourhoods and health including behaviours, as well as physical and mental health outcomes (Faris &

Dunham, 1939). In such studies, it is generally identified in the social and psychological concept that social relationships and experiences contribute to the growth of personality. The results, in general, showed that the uncontrolled occurrences change within the specific areas of the city.

In recent years, more attempts have been made to explore the association between neighbourhoods and health. Today, a variety of theoretical models have been identified and they could be the direct and indirect pathways linking neighbourhoods and mental health.

Studies that had been conducted to understand the effects of neighbourhoods on health can be divided based on their approach such as (1) national or multi-site studies, (2) city or region, (3) neighbourhood-based, and (4) experimental or quasi-experimental. These approaches mentioned are in accordance to the basic designs of (Leventhal & Brooks-Gunn, 2000). This neighbourhood-based approach was also applied for the current study.

2.3.1 Association between Neighbourhood Disorders and Adolescents' stress

In the earlier part of this chapter, the concept of neighbourhood disorder had been introduced and it appears that there has been a substantial increase in research investigating the role of neighbourhoods on adolescents' stress (Morrison Gutman, McLoyd & Tokoyawa, 2005). However, it appears that the clarity on how neighbourhood factors influence adolescents' mental stress is lacking (Hill & Maimon, 2013). Observations seem to suggest that as a younger group, adolescents are often forced into situations that are not within their control and when they are enveloped in such situations, they can become affected either mentally or psychologically. As has been discussed above, a number of environmental elements including neighbourhoods have an impact on adolescents.

In the earlier discussion looking at stress and stressors, it was mentioned that stress and stressors can be distinguished. As sources of stress, stressors are easily available in the living environment of adolescents. The importance of other more closed settings such as peers, school and family in the lives of adolescents may increase the neighbourhood impact and with this in mind, it is proposed that the neighbourhood context needs to be controlled. In addition, what is applicable to adults may not be applicable to adolescents therefore the dimension of neighbourhood should be considered as a very important feature in adolescent related studies (Brooks-Gunn et al., 1993). Many studies, for example, have shown that suicide attempts are reduced due to the interaction between family resources and neighbourhood factors (Maimon, Browning & Brooks-Gunn, 2010).

Evidence has been established by Molnar, Cerda, Roberts & Buka (2008) which show that neighbourhood social resources can help in reducing aggressive behaviours among adolescents. However, some studies like Abada, Hou & Ram (2007) and Stiffman, Hadley-Ives, Elze, Johnson & Dore (1999) do not establish a direct relationship between neighbourhood disorder and adolescents' mental health. These studies have established that support from family and peers can help in mitigating the impact of the perceived neighbourhood disorder on mental health but their findings were based on a western context. Molnar, Cerda, Roberts and Buka's (2008) experiment was conducted on a group of adolescents from St. Louis in the US. In another study, Abada et al. (2007) reported that there was no impact of neighbourhood socioeconomic status on the mental health outcome of Canadian children and adolescents. However, they reported that there was some direct neighbourhood effects on general health status. The study reported that three important factors of neighbourhood namely (a) economic advantage and disadvantage, and (b) residential heterogeneity assessed how these factors affect adolescents' emotional distress.

From readings done of literature, it appears that to analyse the results of studies that are related to mental health and neighbourhood, spatial analysis plays a vital role. Local spatial statistical methods enable the researcher to assess spatial variability of health outcomes in the neighbourhood context, and it can even be used to investigate the association. Studies show that spatial autocorrelation is valid in order to investigate socioeconomic status in the neighbourhood context (Merlo, Chaix, Yang, Lynch & Rastam, 2005). For instance, findings show that participants with low socioeconomic status tend to live in clustered areas. This is interpreted as living close together. From this, it can thus be deduced that spatial statistical analysis could help in locating the standard error estimates of risk factor effects on neighbourhood environment and mental health problems.

Spatial statistical analysis may have been the trend and it appears that there has been a notable increase in spatially extensive research in health and social science studies where evidence is drawn from data of many communities. In this regard, there is now a bigger interest in understanding spatially varying processes in health (Nakaya, Fotheringham, Brunsdon & Charlton, 2005; Holt & Lo, 2008; Congdon, 2011). Besides spatial statistical analysis, another approach is by using global and local statistics. The said approach leads to a completely different level of insight in looking at area-level characteristics and health outcomes (Brunsdon, Fotheringham & Charlton, 2002). For instance, the so-called “global” statistics summarize data for the entire study area such as cities, provinces, or countries while the “local” statistics summarize data for individual places that are located within these larger study areas.

In a study which looked at Nottingham residents who were 15-59 years of age and diagnosed with schizophrenia, affective psychosis, or non-psychotic mental disorders, standardized incidence rates and Poisson probabilities were mapped so as to reveal

significant “cluster” patterns (Giggs, 1986). Clusters of areas with high rates were observed in both central city neighbourhoods and in suburban areas. Geo-statistical models to compare spatial patterns in mental disorders due to psychoactive substance were used. Looking at the neurotic disorders among persons aged between 40 to 69 years of age and residing in Malmö, Sweden, the study revealed that the disorders exhibited different spatial distributions. Mental disorders due to substance use showed greater neighbourhood variation than neurotic disorders (Chaix et al., 2006).

Cluster analysis was used to understand cases where concentrations of individuals’ stress-level is significant to the design of the improved delivery service. When individuals in need of services are clustered in large numbers in particular communities, it may be easier and less expensive to deliver services to them because of the large number of potential clients who support the services. All these analyses mentioned above provide the rationale for the current research in using local spatial statistics to explore stress in the neighbourhood context.

2.3.2 Spatial analysis of neighbourhood disorders and stress

Based on the support to of a classic article, Mayer (1983) discusses two ways in which spatial analysis can increase our understanding of disease pathogenesis. First, geographical studies may suggest possible causal factors. Associations between disease and place imply that the population living in that place possess inherent traits that make the population more susceptible to disease or that the population may experience some increased level of exposure to a risk factor such as environmental causes of diseases. Second, spatial analysis can help to identify how the population adapt and relate to their environment. Such adaptations may be beneficial and protective or maladaptive and detrimental to health. Adaptations to environmental stresses serve as a good example showing that in areas which experience high stress, individuals may reduce their

exposure. Alternatively, they may underestimate the risk and proceed with their daily activities as though no excess risk is present. In the latter case, the maladaptive behaviour may increase their risk of illnesses.

Data used for spatial analysis must contain two classes of information. The first class includes attributes of spatial features which are measured in intervals or ratio variables such as population size, mortality rates, pollution estimates, or ordinal and nominal variables such as disease severity. The second class involves the location of a spatial feature that is described by position on a map which is measured in one of many geographical coordinates or referencing systems (Goodchild, 1987). In bringing these two classes of information together, spatial analysis seeks to assess non-independence or association in values of attributes at the same location or nearby locations or locations which are likely to experience spatial interaction.

Spatial analysis used in a Geographic Information System (GIS) environment can be divided into three broad categories: visualization, exploration, and modelling (Bailey & Gatrell, 1995). In the current research, the modelling method was used to assess whether or not spatial patterns apparent in the data have occurred by chance or whether they display significant departures. Five processes and associated methods which underline most spatial models are autocorrelation tests, interpolation, point pattern analysis, spatiotemporal association, and spatial correlation and regression. The last method has been chosen for the purpose of this research. In other words, spatial autocorrelation means that attribute values (stress) of proximal entities (neighbourhoods) will likely be more clustered or share more similar values than distant ones. Tobler (1970, p. 7) often cites that the first law of geography captures the essence of spatial autocorrelation and he says, "Everything is related to everything else, but near things are more related than distant things."

2.3.3 Moderators and Mediators of the association between neighbourhood disorders and adolescents' stress

As mentioned several times in the previous section, existing literature highlights additional variables which are important to be considered when examining the relationship between neighbourhood disorders and mental health outcomes. These variables can provide a moderating role whereby the association between the neighbourhood disorders and stress depends on the level of the third variable. The presence of a third variable can be associated with a mediated or indirect link between neighbourhood disorders and stress as well.

2.3.3.1 Potential moderators

As defined by Baron & Kenny (1986), a moderator is either a qualitative or quantitative variable that can change or strengthen the direction of the association between the independent and dependent variables. Primarily, family income, education, employment status, age and gender emerged as potential moderators (Simons et al. 1996; Liu et al. 2009; Tendulkar et al. 2010). Although not always explicitly examined in studies in this review, evidence suggesting the potential moderating roles of family income, education, employment status, age and gender will be discussed in this section. Findings regarding interactions between neighbourhoods and their association with stress will be further explored.

2.3.3.1.a Age and gender

Variation in age can be an important factor in the stressful life of adolescents. This can be exemplified by the fact that adolescents' reactions to stressful life events tend to be different from those of adults even within the same condition. Adults may have better judgments due to the wider exposure to life whereas the adolescents have far fewer life

experience in comparison. Studies suggest that the association between neighbourhoods and mental health can be moderated by the age factor as well as the gender of the adolescents. Adolescents in the early age period may be more affected by the environment than older adolescents for example young children will have no clue about problem solving skills as compared to teenagers given the same context of problem to solve.

With regards to gender, it appears that boys are more affected by neighbourhood effects than girls because as boys, they have more resilience than girls to attend outdoor activities as some families seem to be more protective over girls than boys. From this perspective, it can be seen that exposure to neighbourhood disorders would be higher for boys than girls.

Most studies in this review included mixed gender samples of adolescents for example studies conducted by (Greenberg & Schneider, 1995; Macintyre & Hunt, 1997; McDonough & Walters, 2001; Stafford, Cummins, Macintyre, Ellaway & Marmot, 2005; Matheson, Moineddin, Dunn, Creatore, Gozdyra & Glazier, 2006; Oberwittler, 2007; Matheson, White, Moineddin, Dunn & Glazier, 2009) explored possible differences based on adolescents' gender. Oberwittler (2007) found that particularly in disadvantaged neighbourhoods, girls were more sensitive to the violence than boys. In another study, gender was an important factor in coping with stress (Forehand, Neighbors & Wierson, 1991). However, the ability to cope was positively linked to the perception of safety only among girls and exposure to violence only among boys (Rasmussen et al., 2004). Thus, it can be deduced that a large portion of literature emphasise on the importance of gender in looking at the association between neighbourhood environment and stress.

Aggressive responses to stressors are more common among boys than among girls (Rutter, 1987). Although there is recent evidence indicating that violence among girls has increased in the 1990s (Snyder, 2002), boys are still much more likely to act violently.

Qualitative evidence drawn from a study of youths coping with neighbourhood violence suggests that this may be for the need to “save face” in order to prevent social isolation and future victimization (Rasmussen et al., 2004). One study by Jenkins & Bell (1994) reported that girls responded to increased exposure to violence with greater depressive symptomatology and boys, with increased protective measures. Girls seek social support more frequently and effectively than do boys (Boekaerts, 1996). In violent neighbourhoods, this is interpreted as girls associating with the gangs for protection from sexual victimization by dangerous individuals in the community, and boys associate with the gangs for protection from victimization by the gang itself (Rasmussen et al., 2004). Girls are more likely to address problems they face immediately by talking about them with friends whereas boys usually do not address these problems until the problems become imminent, and when they do address the problems, they often manage them alone (for a review, see Boekaerts, 1996). Gender differences may also result from differences in types of violence exposure with girls reporting more frequent sexual victimization and boys reporting other types of interpersonal conflict (for a review, see Jenkins & Bell, 1997). However, gender has not been consistently examined as a possible factor related to the association between neighbourhood context and stress (Chung & Steinberg, 2006; Kohen, Leventhal, Dahinten & McIntosh, 2008) and even if gender has been examined, the effects of gender differences detected could vary when other factors such as single-parent family come into view.

2.3.3.1.b Parental socioeconomic status

Socioeconomic status including income, education, and employment status has been widely studied in previous literature, for instance, as one of the pivotal factors of the association between neighbourhoods and stress (Elliott, 2000; Steptoe & Feldman, 2001; Morrison Gutman et al., 2005).

People of lower SES are more likely to experience unemployment, financial strain, and other forms of chronic life stress than those with high SES. From a sociological standpoint, chronic strain can be linked to various levels of social structure that place low SES individuals at greater risk of stress exposure in their work and family lives, as well as in their local environments. Socially stratified groups are exposed to different levels of persistent community-wide strain which may exert independent effects on health or, interact with individual stressors to influence health outcomes. Communities consisting of lower income individuals, particularly in urban areas, experience higher levels of chronic stress in the form of crime, unemployment, and violence.

Efforts to understand the impact of neighbourhood and area of residence on health have emphasised on characterizing areas in terms of SES and on collective-level variables such as social capital and social cohesion. Waitzman & Smith (1998) showed that residing in a poor area was associated with health risk such as cardiovascular diseases, cancer, and mortality over a 13- to 16-year period. This finding was independent of individual-level factors including household income and baseline health status. The study indicated that effects were particularly marked for younger people (25–54 years of age) at baseline. Effects have been observed for a range of other outcomes too including adolescent mental health, parenting behaviour, and adult depression and self-rated health. Likewise, relationships have been identified as another effect between area of residence and health behaviours such as smoking and physical activity and this is independent of individual SES. It is deduced that this may help to explain some of the relationship effects between neighbourhood context and individual health (Steptoe & Feldman, 2001).

2.3.3.2 Potential mediators

Although the systematic search for moderator variables is relatively recent, social scientists have recognized the importance of mediating variables for a long time. An active organism intervenes between stimulus and response is perhaps the most generic formulation of a mediation hypothesis model. The central idea in this model is that the effects of stimuli on behaviours are mediated by various transformation processes which are internal to the organism. Theories like Baron & Kenny (1986) share a common belief which is the importance of postulating entities or process that intervenes between input and output.

2.3.3.2.a Family functioning

Adolescents who are controlled by their parents may be exposed to less disorders in their environment. The relationship models highlight the active roles which family and parental relationships play in mediating the association between neighbourhood conditions and children's health (Leventhal & Brooks-Gunn, 2000). This set of model suggests that the association between neighbourhood conditions and children's health may be indirect and could be operated through parental behaviours and family functioning. Adverse neighbourhood characteristics like poverty, violence, and a lack of social support may increase parental stress disrupt family functioning which can ultimately affect children's health negatively. In contrast, strong neighbourhood cohesion may mitigate parental stress and strengthen family functioning and this can have positive impacts on children's health (Rand, Ge, Elder, Lorenz & Simons, 1994; Elder, Eccles, Ardel & Lord, 1995).

Additionally, parental behaviours such as control may mediate between neighbourhood and children's health. The extent to which parents monitor or control their children's activities in turn affects their children's exposure to the neighbourhood and this can either

positively or negatively affect their children's health (Klebanov, Brooks-Gunn & Duncan, 1994; Simons, Johnson, Beaman, Conger & Whitbeck, 1996).

The buffering models, originally proposed by Cohen & Wills (1985) have been generalized to highlight that social support either within or outside the family provides a 'buffer effect' which protect children from neighbourhood risks and thereby contribute to children's 'resilience' to adverse neighbourhood conditions (Ceballo & McLoyd, 2002; Caughy, O'Campo & Muntaner, 2003; Fagg, Curtis, Stansfeld & Congdon, 2006; Fagg, Curtis, Stansfeld, Cattell, Tupuola & Arephin, 2008). The buffering models emphasized on the interaction effects between adversity in the neighbourhood and social support in the family/immediate social circle. In other words, social support in the family/immediate social circle can modify or buffer the negative effects of neighbourhood-level risks on children's health.

2.3.3.2.b Individual character

Above all of the factors, the choice a person makes can remarkably increase or decrease his/her exposure to neighbourhood disorders. In making the choice, individual preferences may also be influenced by other factors. In low socioeconomic status neighbourhoods, there could be young people who may prefer to avoid facing the problems existing in their neighbourhoods. There could be some among those in the same socioeconomic status coping with their problem thus, stress. From this disparity, it can be said that the tendency which adolescents adopt and choose to behave within the neighbourhood can be an important factor. In this regard, individual preferences are also taken to be one factor to be assessed in this study as one of the pathways of association between neighbourhood and stress.

2.4 Neighbourhood and Stress in Malaysian Context

2.4.1 Neighbourhood concept in Malaysia

According to the guideline plan for establishing the concept of neighbourhood in Malaysia, a neighbourhood should be designed based on 6 factors including adequate service, mixed land use, dwelling safety, environmental reservation, cleanliness, and sustainability. This particular concept of neighbourhood emphasises on multi-residential development which aims at encouraging social interaction and developing social relationships among people. This interpretation of neighbourhood (Figure 2.2) is applied in designing the layout of the development through the following steps. First, the layout of the housing scheme is designed by a hierarchy through neighbourhood centres, neighbourhood unit and sub-neighbourhood. Second, a community centre is established in each neighbourhood through the provision of public facilities such as prayer hall, kindergarten, playgrounds and a community store. This centre can encourage interaction and develop relationships among neighbourhood residents. Third, community facilities are developed within walking distance (400 meters) of the residential units.

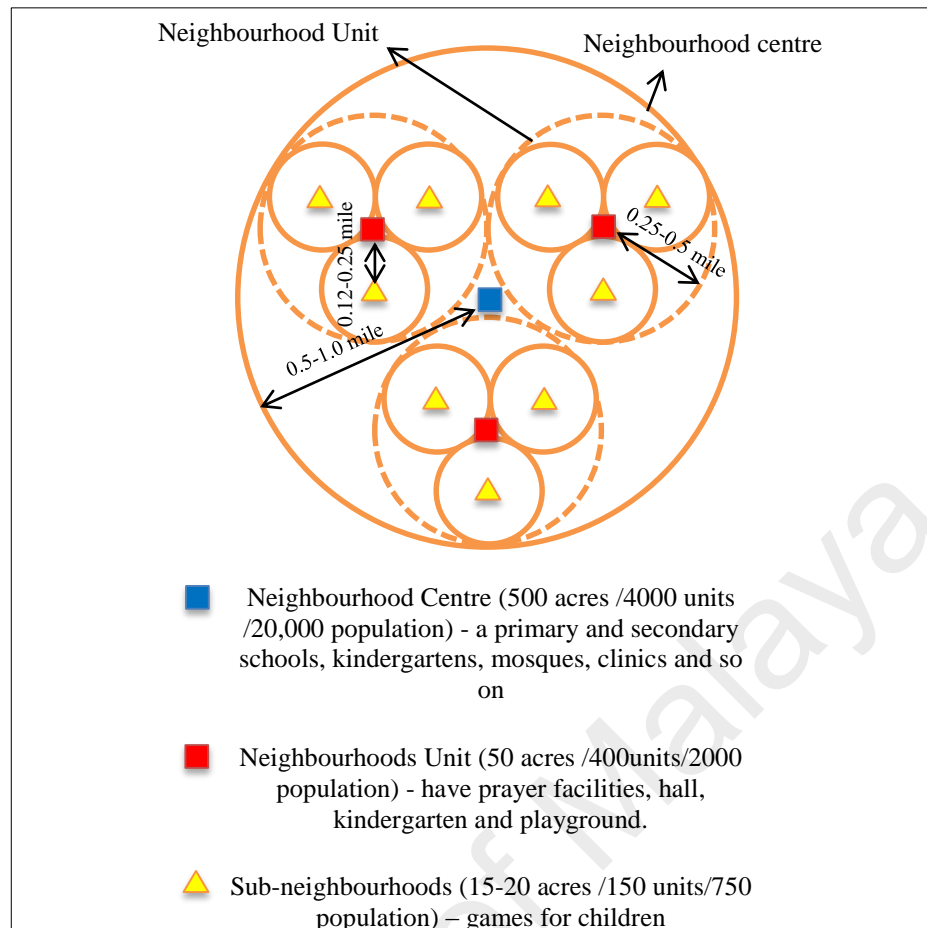


Figure 2.2: Neighbourhood concept in Malaysia.

Source: Planning Guidelines for Neighbourhood, Department of Town and Country Planning, Ministry of Housing and Local Government (2011).

However, the concept of a neighbourhood can be adjusted in the form of large and small neighbourhood groups (Figure 2.3). According to the Planning Guidelines for Neighbourhood (2011) as allocated for small group neighbourhoods, two key principles are applied. First, the design and layout of the road system of local services are shaped as “cul-de-sac” which aims to enhance the safety and interactions occurring among residents. Second, it must look into creating public spaces, recreation sites or lots for games within the sub-neighbourhood so as to create an atmosphere of privacy for recreational activities. In the case of large neighbourhood groups, the following methods are applied. First, it is necessary to develop public facilities and recreation areas which are formed to support at least 4 of the small group of neighbourhood units. Second, large

group neighbourhoods are developed through a concerted effort where streets have names, and buildings must carry similar characteristics of uniformity in building design as well as have common values and unique landscape designs.

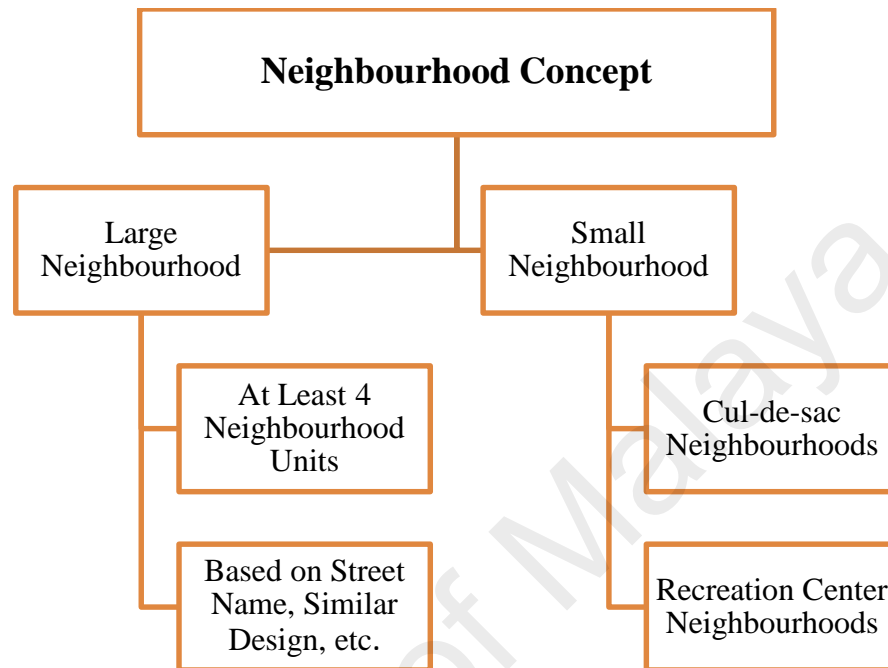


Figure 2.3: Neighbourhood concept based on size in Malaysia
 Source: Planning Guidelines for Neighbourhood, Department of Town and Country Planning, Ministry of Housing and Local Government (2011).

2.4.1.1 Green neighbourhoods

Since the formation of the 8th Malaysian plans, environmental considerations have been included into the planning stage. This has also been incorporated into much of its development plans as it serves as an important concern for the country (Planning Guideline for Neighbourhood, 2011). The 10th Malaysian plan has further emphasised on the idea of liveable cities, and to ensure that this can be accomplished, mixed land use planning has been introduced into existing neighbourhoods as the priorities of living, working, leisure activities within the same compact area. The concept of Green urbanism has also been reflected in the Malaysia's National Urbanisation Policy (NUP) when it was approved by the Cabinet on August 8, 2006. This implies that the country is

beginning to be concerned with the environment. According to Rosly, Puzi & Arshad (2012, p. 5), the green neighbourhood is defined as:

“planned and designed in an integrated manner with the priority given to practice green lifestyle, protection and consumption of natural resources; application of green technology; and recycling that seek to preserve the environment, reduce the ecological footprint, reduce the production of carbon emission, improving of public health, safety as well as general welfare of the community.”

In November 2012, on World Town Planning Day, the Ministry of Housing and Local Government (MHLG) announced five initiatives for endorsing green neighbourhoods. These initiatives include providing pedestrian walkways, bicycle lanes, rainwater system, waste management, and neighbourhood gardens or farms. Indeed, these are the actions to be implemented by the action plan of most green neighbourhood developments.

2.4.1.2 Gated and guarded neighbourhoods

Gated Community is recognized as a group of people who live in a monitored fenced zone even in high-rise buildings, for example, condominium, apartments, bungalow, detached house, and terrace (Planning Guideline for Neighbourhood, 2011). In the context of Malaysia, gated community is more related to group of people who live within landed properties with titles.

In comparison, guarded neighbourhood is characterized as a neighbourhood that is controlled in whole or in parts i.e., to some degree, the planning of the housing development that is located within a landed property carrying an individual title. According to the Planning Guideline for Neighbourhood (2011) the guarded neighbourhood plan can or cannot be providing the residential area with watchman security. From the legal perspective, a guarded neighbourhood plan that provides some

form of security should not carry physical barriers on the street and any implementation made to any exit and entrance of the residential area should not block the inhabitants and the general society. A Guarded neighbourhood plans exists on an ad-hoc basis with the understanding of the inhabitants in an area to make their neighbourhood a protected territory. The concept of Green, gated, and guarded neighbourhood and their role in decreasing the neighbourhood problems will be discussed exclusively in the Chapter Five of this study.

2.4.2 Neighbourhood disorders and stress in Malaysia

In this section the concept of neighbourhood disorders in Malaysia would be introduced first, and next the possible association between neighbourhood disorders and stress would be reviewed and the study framework would be illustrated at the end of this part.

According to Ross & Mirowsky (1999), neighbourhood disorder can be divided into two different categories: (a) social and (b) physical disorders. As shown in Table 2.1, there is a total number of 18 items that were introduced as neighbourhood problems, disorders, or incivility in the previous studies. Here, two aspects need to be mentioned. First, those items are related to the western setting, and in the case of Malaysia, not all of its studies can be supported by literature and previous findings. Therefore, only the items that have been supported by literature could be implemented in the current research. Second, some of the items mentioned are related to crime, (e.g., burglary). Since, it had been explained that those factors that are related to major crimes are not the aim of this study; the following justification will explain why the items that support the case of Malaysia were selected, as has been shown in the factors of neighbourhoods that affect mental health, or wellbeing of residents.

2.4.2.1 Social Disorders

Neighbourhood social disorders are explained in the following sections. These are identified through the literatures and are supported by the studies in Malaysia as well.

2.4.2.1.a Fighting

The act of some form of hostility like fighting, arguing, or hassling may happen in any neighbourhood and such hostility can be caused by many reasons. For example, in neighbourhoods that are multi-ethnic, most of the neighbours living in the same residential area may experience problems dealing with their daily lives and events as a result of a difference in culture or even socioeconomic class. This phenomenon can be frustrating and stressful to the residents and the outcome of those frustrations and stress is that it affects the personal wellbeing of the people who live in those places. In the context of Malaysia as a multi-ethnic society, fighting among each other or experiencing common disagreements and arguing with each other may be inevitable. This tend to occur in cases where the presence of “Others” such as migrants living in the same residential area (Hock-Tong, 1997) seem to be more actively employed than other ethnic groups can cause discontentment and fights. In some residential areas in Malaysia, migrants of a particular ethnic group or nationality may form themselves into groups to become part of the national population where they reside in so as to position themselves anew. Occasionally, the forming of migrants as part of the national is created as a result of government intervention where the government aims to promote ethnic harmonization in specific nation-building projects (Dannecker, 2005). For this to happen, it is therefore necessary that the Malaysian government focus on a social planning scheme that can enable it to develop faster as a developing country for its growing generation of children and adolescents (Hock-Tong, 1997). Nonetheless, as studies have shown,

neighbourhoods in the *Klang Valley* seem to be experiencing racial riots and fights caused by tensions that have been brought about by various factors.

2.4.2.1.b People Loitering

The notion of loitering suggests that people hang around a particular place with no specific purpose. People loitering has been associated with illegal activities and this occurs in different parts of cities or neighbourhoods (Bird, Masoud, Papanikolopoulos & Isaacs, 2005). As a common occurrence in most urban areas, people loitering is more visible by residents who seem to be sharp in identifying those people who are merely passing around their residential area possibly due to their daily activities of knowing familiar faces and activities. The presence of people loitering can provoke the idea that their residential area is of low quality and such thoughts make them view their residential areas as being deteriorated and this too can affect their personal wellbeing as it causes stress and concerns. Therefore, if studies can help to identify such a phenomenon and be able to prevent people loitering from becoming a common feature of the residential area, the residents' sense of security is elevated and this can remarkably improve their sense of safety living in urban neighbourhoods. Accordingly, this can also affect the status of liveability, and the degree to which an area is considered to be comfortable, attractive, and safe to live.

2.4.2.1.c Young ganging

The notion of gangs has existed since time immemorial and gangs are perceived by most to be trouble makers. They are often organised under particular heads or leaders. In certain cases, it is the neighbourhood environment that gives rise to gangs as young people living in certain residential areas experience common problems between each other. In particular, adolescents can become bored under stressful living conditions such as

cramped spaces and in order to vent their boredom, they resort to spending superfluous time with friends and as groups began loitering around nearby shopping complexes, internet café, or bars. This exposes them to various unhealthy activities and influences. Young ganging has been found to be a social problem because of the rapid urbanization of a nation such as Malaysia (Hock-Tong, 1997; Mohamed, 2002).

2.4.2.1.d Drunken people

Alcoholism is the regular consumption of an unhealthy substance. In most social contexts, alcohol is considered to be an integral part of most social occasions among many ethnic groups. Many countries in Asia have not given alcohol the serious attention accorded to other addictive drugs such as narcotics and nicotine although alcoholism can be the catalyst to broken relationships and families becoming dysfunctional, just as drugs do to the society. The reality about alcohol consumption is that consumption in developing countries is increasing. The phenomenon is also rising in the South East Asian (SEA) region. In the SEA region, unhealthy habits in drinking tend to occur more commonly among the lower socioeconomic groups of society. Thus, drunken people may appear in different parts of cities including in various neighbourhoods. Despite the large body of literature mentioning the relationship between and neighbourhoods, there is little evidence shown in studies which consider the occurrence of drunken people wandering in neighbourhoods. Therefore, assessing the experience or perceptions of residents about drunken people can be one of the most important social issues in many countries such as Malaysia. Since the problem of drinking alcohol is not given the serious attention it warrants, and the impact that drinking can cause to a neighbourhood, it is imperative that it becomes one source of factor to consider.

2.4.2.1.e Drinking in public

As alcoholism is linked to drinking, it cannot be dismissed that drinking can take place at home as well as in public areas. The idea of drinking in public can conjure many images and one is the image of someone holding a bottle by another or groups of people on the street. However, in countries like Malaysia where the national religion is Islam which forbids the consumption of alcohol, drinking as social or personal activity can take place in many café or restaurants which are located in specific residential neighbourhoods which allow the operation of such restaurants or cafes. These types of restaurants or café may occasionally offer open spaces for their customers. In this regard, the activity of drinking then becomes visible for anyone who passes by the same street. Such an activity has been observed to occur in some high rise buildings in Malaysia too. Interestingly, studies show that poor households tend to spend a greater percentage of their income on alcohol (Assunta, 2001). Therefore, this factor can be regarded as one of the neglected social disorders that should be considered for study in countries like Malaysia.

2.4.2.1.f Illegal selling

A street market is an outdoor market that has been traditionally held in a market square in a market town, and often, it is held only on particular days of the week. However, not all of these activities held in a street market are legal or ethical and this may be due to many reasons. In fact, one can see several individuals selling wares illegally within the market space for instance, migrants selling accessories. There are studies which showcase such incidents in Malaysia (Bhowmik, 2005; Rahman, Haque, Khan & Murtaza, 2012) and such incidents often have reasons that to justify the occurrences in street markets. The cause of the development of such activities which are considered unethical is not the aim of this study hence; this chapter will not be dwelling on it. Nonetheless, it is perhaps

worthy of being considered as one specific item to be included in studies focussing on neighbourhoods in future.

2.4.2.2 Physical Disorders

The physical appearance of a place shows others whether or not it is ordered as a place. When there is disorder in a place, the environment tends to be chaotic with high noise levels, filth and it appears as if there is anyone to maintain the place. The buildings in such an area would look very much in need of maintenance as they look dilapidated. Vandalism would then become a common feature on walls or buildings and so the place would be covered with graffiti. Such a scenario painted clearly indicates a total breakdown of social control. A neighbourhood in need of maintenance may also be surrounded by visible signs such as burnt cigarettes or cigar butts on the ground of sidewalks/gutters' and the garbage bins would be over strewn with litter on the sidewalks. There would also be signs of empty liquor bottles being strewn along the streets; there would be unpleasant graffiti or the visible graffiti would have paint written over it; there would be abandoned cars around corners; there would be signs of empty syringes all over the place and empty bottles or packages indicating usage of drugs and there could also be political message on walls (Sampson & Raudenbush, 2004). All these are signs of a neighbourhood lacking in maintenance.

2.4.2.2.a Abandoned buildings or cars

Abandoned building or cars that have been left completely unattended to is counted as one of the neighbourhood factors that cause problems such as illegal dealings. In the case of Malaysia, one can notice that some buildings have been abandoned either because of the developer's poor maintenance or because these buildings are no longer usable for owners (Lateef, 2009). Buildings may also be abandoned because of the delay in the

construction process. A large body of the literature reviewed supports the idea that presence of abandoned building or cars can be a troubling sign in urban neighbourhoods. Therefore, this factor should be considered in studies determining the quality of a neighbourhood because its existence suggests that it could serve as a habitation for others committing any form of illegal activities.

2.4.2.2.b Garbage

Families discard rubbish because they are waste products. In an urban neighbourhood where garbage, litter, trash, or junk can be found, one has to note its volume and how they are disposed of. In some urban neighbourhoods, the presence of such waste may not augur well because it can cause deterioration in health among residents due to microbes and other toxins. From the perspective of landscaping, waste or garbage can turn the quality of the neighbourhood negatively, causing a decline in land prices and making it a less than desirable place to stay. In the case of Malaysia, it is supported that neighbourhoods where these items can be found frequently are not really suitable for outdoor activities such as jogging, or bicycling, and these can overall, cause dissatisfactions among residents (Salleh & Badarulzaman, 2012; Saimon, Choo & Bulgiba, 2013).

2.4.2.2.c Empty beer bottle

In the earlier discussion, it was mentioned that drunken people and drinking occur in urban neighbourhoods. This was then linked to sightings of empty bottles of alcohol. If drunken people and drinking can be rampantly found in urban neighbourhoods, then it can be prognosticated that empty beer bottles or cans might also be found in some areas of the neighbourhoods. Adolescents living in the same area when commuting to and from school may inevitably chance upon their surroundings such empty vessels as a result if being attentive to their surroundings and coming across such objects could be detrimental

to their image. Therefore, with reference to the above explanations regarding drunken people, drinking and empty beer bottles, it can be suggested that empty beer bottles could be viewed as one of the physical disorders which ought to be assessed more.

2.4.2.2.d Cigarettes

Studies show that the prevalence of smoking among Malaysians is high (Yong et al., 2008). If this is the case, then it is unavoidable that cigarette butts could be seen thrown all over the street sidewalks. Such a sighting, especially when it becomes rampant, as there is no strict legislation to prevent people from smoking in residential areas or open spaces, does not augur well for neighbourhoods. The image of open places strewn with cigarette butts can affect and deteriorate the appearance of a neighbourhood on one hand and on the other, also affect the mental health of pedestrians living in the same area. Adolescents, who commute to and from school by foot or even in leisure walking, may chance upon seeing these cigarette butts on the sidewalks and this can affect their psychological development (Lee, Paul, Kam & Jagmohani, 2005; Parkinson et al., 2009; Sirirassamee, Sirirassamee, Borland, Omar & Driezen, 2011).

2.4.2.2.e Graffiti

As explained above, graffiti exists when there are groups of idle youngsters hanging around a place doing nothing. Graffiti, as a one of the problems of incivility in neighbourhoods have been studied by many researchers in the western context (Covington & Taylor, 1991; LaGrange et al., 1992; Perkins et al., 1992; Taylor & Jeanette, 1993). In the case of Malaysia, graffiti is not considered to be a problem of incivility but it has, nevertheless, been studied as a factor that is related to building design or building maintenance by a few researchers (Chia & Stephen, 2003; Chohan et al., 2010). Although not a serious crime, these studies manage to highlight the presence of graffiti in Malaysia

and its problems. If such is the case, it is recommended that this factor of graffiti be considered in other fields of studies such as neighbourhood disorders and the perception of adolescents.

2.4.2.2.f Graffiti painted over

In the section above looking at graffiti, it was mentioned that graffiti is not a crime. Nonetheless, graffiti that has been painted over is considered as vandalism and this factor remains to be one of the urban neighbourhood's problems which affect buildings or even the residents in many ways. In Malaysia, a study by Mujab & Munira (2010) provided evidence which demonstrate that vandalism exists in low cost flats in *Shah Alam*, Malaysia. However, there were no studies which could illustrate the effect vandalism may have on residents living in neighbourhoods in Malaysia. A large body of literature only seemed to indicate the presence of graffiti that had been painted over and no more than that. This gap implies that the factor of vandalism in neighbourhoods could be a contribution affecting the mental health and wellbeing of residents including adolescents (Lewis & Maxfield, 1980; Skogan, 1990; Perkins et al., 1992) living in those areas.

2.4.2.3 Neighbourhood disorders and stress in Malaysia

As it has been stated in the previous sections, experiences of stress have been studied in Malaysia before and most stress experiences, it was found, are related to life events such as academic studies, parental behaviours, or peer influence (Yusoff, 2010). Though, there is lack of evidence to show if there is any association between stress and neighbourhoods in this context.

The nearest study to this is a study from Saimon et al.'s (2013) that assessed neighbourhood disorders can be related to the fear and as a consequence less activity. In the Malaysia context, for instance, a study by Saimon et al. (2013) using the photovoice

technique exclusively showed that having a feeling that the neighbourhood is unsafe can prevent many healthy activities from being carried out by residents. In Saimon et al.'s (2013) study, every participant was provided with a camera to record the problems related to physical activities which they experience in their neighbourhood. In this context, physical activity was defined as physical movement or mobility carried out for the purpose of leisure (for example, walk in the park, and workout at the gym) or transportation (for example, walking/bicycling to and from school) in the participants' neighbourhood. The participants were asked to take a photo of what they see within one week. Out of 166 photos submitted, eight (8) photos were then selected to describe the problems in the neighbourhood. From the angle taken of average income of the families involved, it was found that the participants in Saimon et al.'s (2013) study belonged to the lower-middle-income and poor groups. The main findings of their study centred on the concepts of "safety," "facilities," "parental restriction", "friends," "cultural traits," "media, "community cohesiveness," and "weather." The central theme of their study focused on the feeling "of being unsafe" in the neighbourhood.

These problems are categorized into (1) physical environment (e.g., traffic hazard, animal threats, poor aesthetics, and availability of and accessibility to recreation facilities) and (2) socio-cultural environment (crime, parent-constrained behaviour, friends, gender role, neighbourhood cohesiveness, ethnic segregation of play space, and screen-based entertainment). For example, negative feeling about the drug dealers, or fighting between friends was expressed by adolescents as the reasons why they do not intend to have the outdoor activities (Saimon et al., 2013).

Based on the above discussion this part would ended up with a study framework that show the main concerns and how this study would fill up the gap of finding the association between neighbourhood social and physical disorders and adolescents' stress in Malaysia.

2.4.3 Study Framework

This research aims to assess the association between neighbourhood disorders and stress among adolescents. The research is undertaken because there is limited evidence which highlights this particularly in the Malaysian context even though the role of neighbourhood is important in determining the condition of residents' mental health. There are many different factors which neighbourhoods comprise and are made up of and this research will focus on two perspectives of neighbourhood disorders: social and physical disorders only. This is because studies have shown the contribution of neighbourhoods to the mental health especially through two aspects of social and physical disorders. There are also other factors that effectively contribute to this association including socioeconomic status, family functioning, or individual preferences.

The conceptual framework adopted for this research is based on two models, one is the model suggested by (Hill & Maimon, 2013) which shows that the association between neighbourhood and mental health can be moderated by other factors such as individual characteristics, socioeconomic status, age, gender. The other model is the one proposed by Fan & Chen (2012) which show that family functioning acts as mediators in the association between neighbourhoods and children's health. The framework is further illustrated in Figure 2.4 and it is used to assess the association of neighbourhood and mental health outcomes. As the study framework demonstrates, the model is a moderated mediation model and it is introduced so as to explain that both mediators and moderators can alter the association between neighbourhood disorders and stress. Indeed, the mediated association can either increase or decrease by moderators such as age and gender.

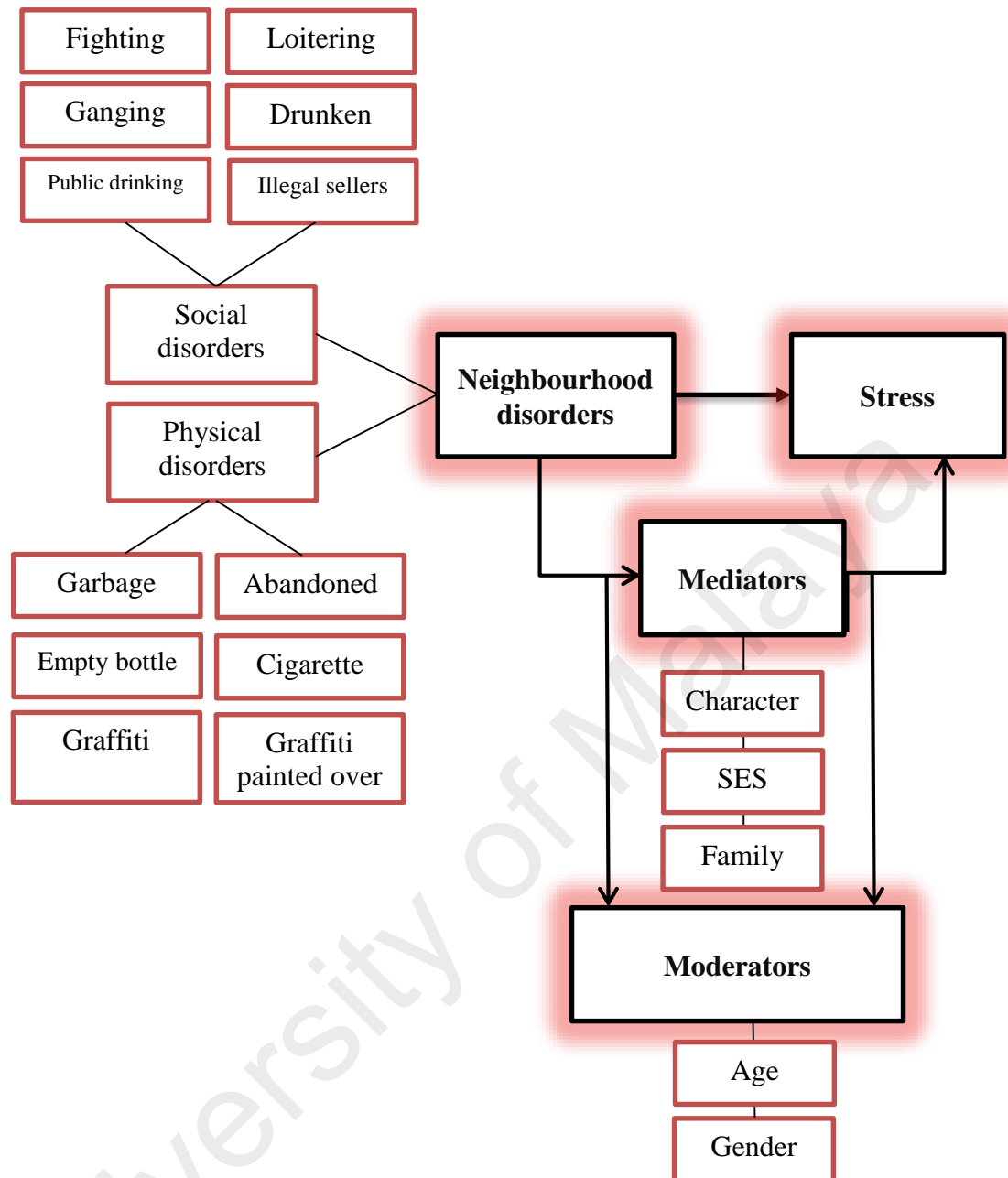


Figure 2.4: Study framework

The explanations of mediators and moderators will be further discussed in the next chapters. The study framework proposed here begins with the independent variables of neighbourhood disorders. As was explained before, the perspectives taken to examine neighbourhood disorders are of two different categories: social and physical disorders. Social disorders include looking at fighting, adult loitering, drinking in public, peer groups as gangs, drunken people, and illegal sellers. Physical disorders include looking at presence of cigarette butts on the sidewalk, garbage or litter, empty beer bottles, graffiti,

graffiti that has been painted over, and abandoned cars. In the case of Malaysia, so as to ensure that all the items related to the disorders exist, a thorough literature review on neighbourhood disorders or neighbourhood problems are gathered and verified with previous and current studies done in Malaysia. Items that are considered to be supporting the case of Malaysia appear to be mentioned in the literature and this helps. The second part of the study framework discusses the mediators which include parental socioeconomic status, family functioning, and individual characteristics.

All of these factors have been discussed in the literature to show how they are connected to the association between neighbourhood and stress. The third part of the study framework will discuss the moderators which are types of variables that a person inherits and cannot change. These factors will be further discussed in the next chapter. Many studies have shown that individual factors such as age, gender can contribute to the association between neighbourhood and stress. The last part of the study framework discusses the dependent variables or stress as a mental health outcome. Although mental health can create many outcomes, in the context of this study, stress is selected as a factor to examine because it can effectively change the adolescents' behaviours particularly from early adolescence.

CHAPTER 3: METHODOLOGY

This chapter is organized into three sections. The first section provides basic information regarding the current research such as the study area, the design, and sampling. The second section which is the largest and the main part of the methodology explains the process of data collection including experiences and perceptions of neighbourhood disorders and stress-level. The third section of the methodology is about the data analysis.

3.1 Study Area

The city of Kuala Lumpur (KL) is ideally suited for the purpose of this research because it is the capital city and is most populated city in Malaysia among local government areas according to the Department of Statistics (Department of Statistics, 2010). A large number of studies had shown the hazardous effect of population increase in cities, specifically metropolitan areas affecting mental health (Phillips, 1993; Parameshvara Deva, 2004; Galea, Freudenberg & Vlahov, 2005), thus the city of Kuala Lumpur was selected. Studies indicate that metropolitan areas can dramatically change the health and behaviours of the residents. With the city of Kuala Lumpur becoming more developed and populated, it is deduced that this trend of phenomenal change may increase in the next few decades. The more populated the area, studies say, the more stress residents experience. It has been prognosticated that the prevalence of stress would be higher in populated regions than in less populated regions in future decades. Therefore, research investigating the small contribution of neighbourhoods located within in metropolitan cities like Kuala Lumpur can remarkably help research to predict the stress-level experienced by the residents in Kuala Lumpur. This finding can be of importance to various departments like Ministry of Health.

The metropolitan area of Kuala Lumpur has almost tripled in area since 1950 and currently, it occupies an area of approximately 243 square kilometres (not including any of the satellite new towns). It has been estimated that just in the last twenty years, Kuala Lumpur has lost nearly 50% of its green spaces mainly to residential development which was for the need to cater to its population increase (Firpo, 2008). Green spaces had also been reduced as a result of industrial development and the current estimated population of people residing in the Kuala Lumpur area is 1.7 million as of 2013 (Department of Statistics, 2013).

Figure 3.1 shows the location map of Kuala Lumpur situated in the country of Malaysia. With the populous residents residing within the area, neighbourhood boundaries in Kuala Lumpur this needs to be clearly designated. Figure 3.1 illustrates the 283 neighbourhood boundaries for Kuala Lumpur (DBKL, 2014). Based on the structure plan drawn in 2012, Kuala Lumpur has thus far been divided into six strategic zones: (1) the City Centre, (2) *Wangsa Maju – Maluri*, (3) *Sentul – Menjalara*, (4) *Damansara*, (5) *Bukit Jalil*, and (6) *Bandar Tun Razak*.



Figure 3.1: Location map of the study area

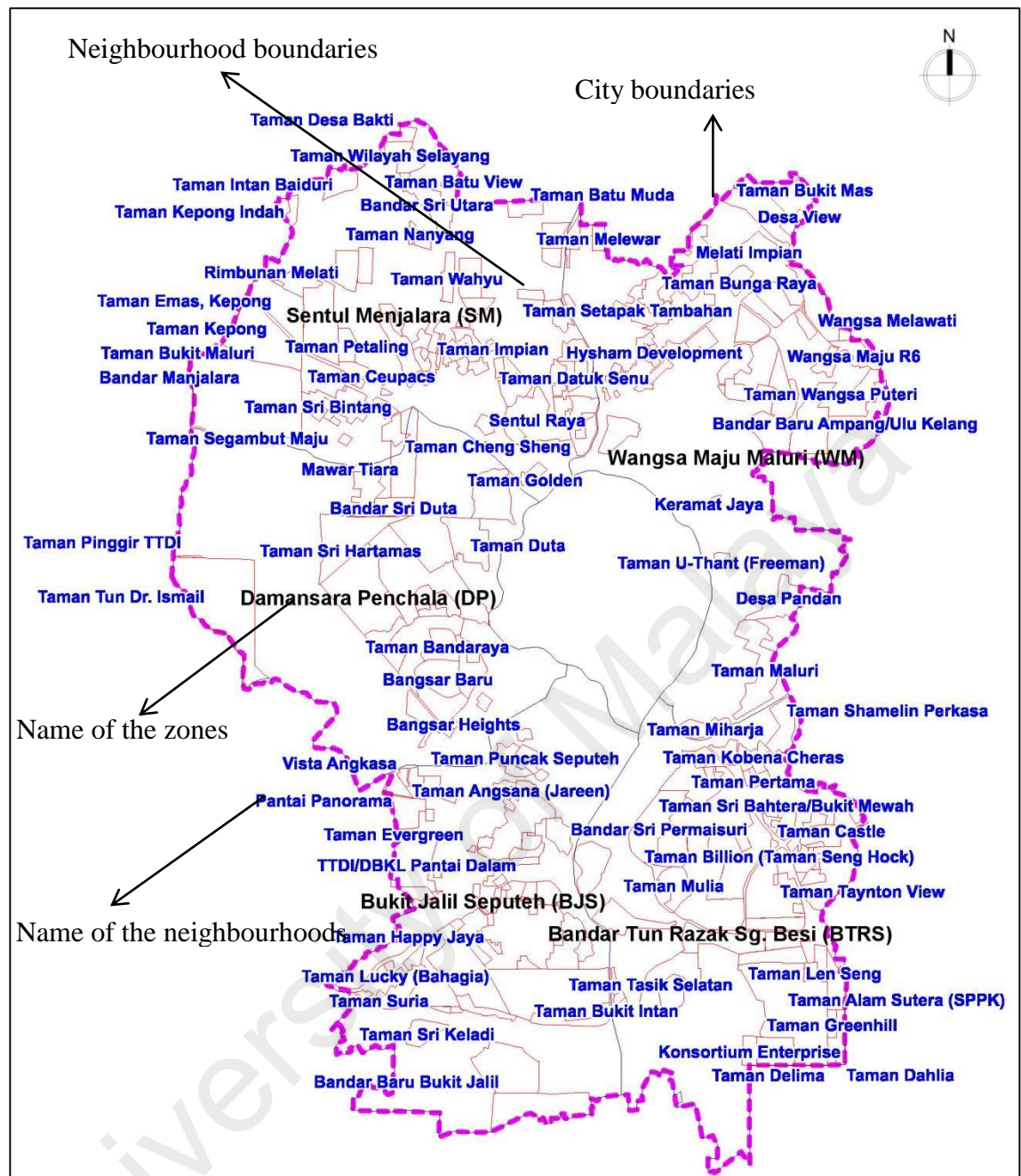


Figure 3.2: Neighbourhoods' boundary in Kuala Lumpur, Malaysia
Source: DBKL (2014)

The above figure displays all the neighbourhood boundaries located within Kuala Lumpur.

3.2 Study Design

This study is considered a large observational and cross-sectional study and it investigates the association between neighbourhood social and physical disorders and adolescents' stress among residents situated in different zones and neighbourhoods of Kuala Lumpur, Malaysia. Since this is a large study, quantitative research approach is selected because a quantitative method enables data extracted from a large study to be analysed more systematically. As has been discussed in chapter two, out of the four different approaches which studies use in their investigation of neighbourhoods and health³, this study selected the one that is neighbourhood-based because it permits the use of multilevel data analysis techniques such as multiple regression to be applied (Duncan & Raudenbush, 1999; Sampson & Raudenbush, 1999). Moreover, the effects of neighbourhood on health could also be better assessed through using the neighbourhood-based approach.

3.2.1 Why neighbourhood-based approach?

The following are the reasons explaining why neighbourhood-based approach is a better approach for this study. Neighbourhood boundaries, when used in a study, help researchers to get an approximate assessment of the neighbourhood effect. In comparison, the national or city based approach can be considered to be more challenging during the process of evaluating the results if the number of neighbourhood units are not clearly stated. This lack of clarity in the approach may be due to the differences occurring in local samples and national samples as there are restrictions in the range or types of neighbourhood sampling. Followings are the brief comparisons of national-level and city-level approaches.

³ These approaches were neighbourhood studies at national-level, city or regional-level, neighbourhood-based, and experimental.

More reliable neighbourhood impacts have been found in the national research design of neighbourhood studies compare to city-level approach focussing on the health and wellbeing of children (Brooks-Gunn, Duncan & Aber, 1997). This could be attributed to the variance existing in the variety of neighbourhoods being sampled. As has been explained, there was a wide variety of neighbourhoods in the national-level research versus a partial change in the city-level approach. Likewise there were differences in the number of members being studied in the neighbourhood. To compare the number of samples in each approach it can be said that in the national and multi-site research, very few samples of each neighbourhood had been utilised. However, in the local and regional research, there was a moderate number of samples for each neighbourhood being used.

However, results of a study by Duncan & Raudenbush (1999) showed that the neighbourhood study of ethnicity, female-headship family, well-being, education, poverty, residential movements, and male unemployment were very much interrelated in the city-level research approach than in the national-level approach. Consequently, it was difficult to find out much about the neighbourhood effects. Moreover, multilevel analysis is possible only in neighbourhood-based designs. According to their study, Duncan & Raudenbush (1999) found that enough grouping is important, for instance, anywhere between 15-30 samples for each neighbourhood, multivariate analysis is required in order to get a trustworthy evaluation of neighbourhood impacts. In this respect, neighbourhood-based designs where individuals are nested within neighbourhoods (nested structures) are taken into consideration by such analytical techniques. Selection of study design based on neighbourhoods allows an assessment of the variability of outcomes, both within neighbourhoods and across them. As a result, this gives a more reliable evaluation of neighbourhood association to health.

3.3 Study population

According to the Department of Statistics, enrolled adolescents in 2011 were 111,853 (Department of Statistics, 2013). The list of schools is listed in the appendix G. According to the UNESCO Institute of Statistics, school enrolment for lower secondary duration in 2011 in Malaysia was 91.87%. According to this UN estimate, females' gross enrolment ratio in lower secondary education was 87.74%, while males gross enrolment ratio was 96.24%.

The target population selected for this study are of both genders and they fall under the category of adolescents and were aged between 13-15 years-old. All were enrolled in the school in 2014. The reason adolescents were targeted for this study is because they were at the onset of physical and behavioural change and so, are likely to be more affected by the stress of living in urban areas. Ultimately, they might be vulnerable to the hazards of urbanization and increasing urban population.

3.4 Sample size

The sample size was calculated by using the population survey method where Sample Size Calculator for Prevalence Studies (Arya, Antonisamy & Kumar, 2012; Yusoff et al., 2014) was used. Based on 95% confidence Interval, a minimum sample size of 375 or more was required and this made up the population size of the adolescents drawn for this survey. The formula used for estimating the sample size is as follows:

$$n = \frac{Z^2 \times 1 - \alpha/2 \times P (1 - P)}{e^2}$$

Where:

n = number to sample

$Z^2 = (1.96)^2$ for 95% confidence ($\alpha = 0.05$)

P = “best guess” for prevalence (± 0.50)

e = maximum tolerable error for the prevalence estimate (± 0.05)

3.5 Sample selection

Multi-stage (probability) sampling was selected for the purpose of this research. First, the total number of 24 schools were randomly selected from different post codes stated within Kuala Lumpur. This was about 25% of all schools located in Kuala Lumpur (24 schools out of 94 schools⁴). Second, from each school identified, nine classes⁵ were randomly selected. Third, all the students enrolled into those classes ⁶ were invited to participate in the study. Finally, around 6000 forms were distributed to all the participants of 216 classes. The number of schools per zone were calculated based on the population density in each zone. Consequently, out of about 6000 distributed questionnaires, a total of 844 students and their parents from 62 different neighbourhoods in Kuala Lumpur consented to participating in this research.

Table 3.1: The number of selected secondary schools based on population density.

Zone	Total school	% of whole	The number of selected randomly schools
<i>City Center</i>	6	6	N/A ⁷
<i>Wangsa Maju</i>	29	31	8
<i>Sentul</i>	19	20	5
<i>Damansara</i>	15	16	4
<i>Bukit Jalil</i>	14	15	4
<i>Bandar Tun Razak</i>	11	12	3
Total	94	100	24

⁴ The list of all 94 schools selected from the Department of Education.

⁵ The classes were of three different level of intelligence for each school. Therefore, three classes from each level of low, medium, and high intelligence were selected for the purpose of this study.

⁶ Estimated number for each class was 28 students.

⁷ There is no school selected from this zone as it is a commercial zone.

3.6 Participants

The study ultimately employed a sample of $N = 844$ (% 55.5 female and % 40.0 male) with a range of those aged between 13-15 years old. Data of the adolescents and their parents or guardians who lived in the household and who knew about the children's health status were then collected. The adolescents were enrolled in public secondary schools or *Sekolah Menengah Kebangsaan* (SMK) where the instruction of teaching is mainly in Malay. Table 3.1 shows the descriptive analysis of the study participants.

Table 3.2: Descriptive analyses of study participants

(n=844)	n	%
Age ($M=14.8$, $SD=0.848$)		
13	234	27.8
14	276	32.8
15	266	31.6
Others	019	02.2
Gender		
Female	468	55.6
Male	338	40.1
Ethnicity		
Malay	361	42.7
Chinese	262	31.4
Indian	122	14.4
Others	057	06.7

3.7 Data collection

The main aim of this research, as mentioned before, was to examine the association between neighbourhood social and physical disorders and stress. Data collected for this study are as follows. (a) For the first objective, experience and perceptions of neighbourhood disorders collected from students were through survey. (b) For the second objective, stress-level data were collected from students through a 58-item self-reported questionnaire. (c) For the third objective, to examine the association between

neighbourhood disorders and stress, data were used from the first two phases mentioned to meet the requirements of the multivariate analysis, data in terms of age, gender, individual preferences, and neighbourhood satisfaction were collected from the students in a survey. Likewise, parental socioeconomic status, general health status was similarly collected from the parents.

3.7.1 Pilot study

The final draft of the translation in the Malay version of the questionnaires (explained fully in the section 3.7.5 this chapter) were used in the pilot pre-test on 50 students before it was applied on the larger sample. As students reported, the questionnaire was comprehensible for them.

For the purpose of collecting data, a set of procedure was followed. First, parents of the school children selected were asked to fill up the form and give their approval on the consent letter. Data related to socioeconomic status, family functioning were thus accessible. Next, adolescents who provided the consent letter were asked to participate in the survey which consisted of three main parts: experiences and perceptions of neighbourhood disorders, stress-level, and their individual preferences.

Data collection procedure is as follows. First of all, permission to conduct research for all the phases of the study was sought and received from the University of Malaya and then from the Ministry of Education and State Department of Education of Malaysia. For administrative purposes, invitation to participate in the research also were sent to the directors of those selected schools (Appendix A).

After speaking with the headmasters and explaining the purpose of the research, confirmation was referred to the counsellor of schools. Before starting the survey, all instructions were explained for the benefit of the schools' counsellors and teachers. In

January, 2014, consent forms were distributed along with information sheets prior to data collection as completed consent forms were required before any specific approach could be made to the potential participants themselves (Appendix B).

Upon completion of the consent letters, a pre-test was conducted among 50 students. All the students who returned the consent forms were asked to fill up the stress and neighbourhood disorder forms in their class. The teachers involved had explained the instruction to the students. The questionnaire was administered in the class during reading time and the session was fully supervised (Figure 3.3). This is because the schools' headmasters/headmistresses had advised that it would be the most suitable time. The time of administration of the questionnaire was in the morning where students were deemed fresh and ready to answer the questionnaire items. The questionnaire administration was conducted at the same time for all the classes involved in the morning except for those schools that comprise afternoon session classes (Figure 3.4). Completed packages of this research include the consent letters and questionnaires from parents which were kept at the respective school until all the questionnaires had been administered and collected back on the second visit.



Figure 3.3: Participants in the process of filling up the questionnaires



Figure 3.4: Giving instructions to the participants
Source: Field study (2014)

3.7.2 Measuring neighbourhood disorders

The measurement used for assessing neighbourhood disorders in this research was derived from the work of Coulton, Korbin & Su (1996) and it is similar to those used in other research investigating perceptions of neighbourhood disorders (Sampson & Raudenbush, 2004). Experiences and perceptions of neighbourhood conditions were measured in two domains: social disorders and physical disorders. In the first domain, each item for the experience part was rated on a 4-point Likert scale ranging from never = 1, sometimes = 2, often = 3, to very often = 4 and yielding scores ranging from 0-24. The questionnaire inquired about experience of neighbourhood disorders in the past year. The second domain was about how stressful these items are and these were scored based on a five-point scale consisting of not at all stressful/not relevant = 1, a little stressful = 2, moderately stressful = 3, quite stressful = 4, and very stressful = 5 and yielding scores ranging from 0-30. For each domain assessed, the score was estimated as the sum of the items in the scale (Appendix D).

Social disorders were assessed through self-reported questionnaires by using 12 items contained in two parts: experiences of social disorders and perceptions of those items in the neighbourhoods were assessed through six questions which concerns robbery/fight, unemployed adults, public drunkenness, illegal selling, gang activity, and adults hanging around, all of which were seen frequently or were stressful in the neighbourhood.

Similar to the first part, physical disorder was assessed by using the same scale and score. The physical disorder scale was based on six questions which measure whether trash, cigarette butts on the sidewalk, beer bottles visible in the street, graffiti, abandoned cars all of which constituted “frequently” in the neighbourhood and may be viewed as “stressful” for adolescents and this was further contextualised to the previous year of their experience.

3.7.3 Measuring Stress-level

The second phase of the research which was related to the second objective looks at adolescents' stressful life events which were measured by using the 58-item listed in the Adolescents Stress Questionnaire (ASQ) (Byrne et al., 2007). Adolescents who were also students were asked to indicate how stressful each of the experiences or situations reported in the items had been for them during the previous year of their experiences. Each stressor item was rated on a five-point Likert scale where the respondents self-reported individual stressor assessment: 1 = not at all stressful (or is irrelevant to me), 2 = a little stressful, 3 = moderately stressful, 4 = quite stressful and 5 = very stressful. According to Byrne et al. (2007), the item that scored 1 was to reflect the no self-reported stress at all or the item had not been encountered. Therefore, if the item scored 1 it is considered as not causing stress at all.

A four-step procedure was used to validate the translations of the ASQ from Australian English to Malay. The procedure involved first getting bilingual, native Malay translators from the Malaysia National Institute of Translation to translate the questionnaire from English to Malay. Second, the translated versions were then assessed by mental health experts and the differences were corrected in order to find the most appropriate words, expressions and sentence structure to capture the meaning of the items. Third, other translators who had not seen the finalized Malay version of the ASQ did the back-translation from Malay to English. Translators were native Malay and native English speaker. Fourth, the original and back-translated versions of the questionnaire were compared to ensure that the translation was complete.

The latest Australian version of the ASQ resulted in a series of 10 factors of adolescent stress which address stress of home life, school performance, school attendance, romantic relationships, peer pressure, teacher interaction, future uncertainty, school/leisure

conflict, financial pressure and emerging adult responsibility (Byrne et al., 2007). Internal consistencies of this questionnaire were the same when examined using Cronbach's alpha coefficients. These ranged from 0.57 (Stress of emerging adult responsibility) to 0.85 (Stress of home life) with 8 of the 10 scales having internal reliabilities above 0.70 (Table 3.2).

Table 3.3: Reliability test of adolescents stress questionnaire

Category	Item	Cronbach's α
Home life	10	0.849
School performance	7	0.752
School attendance	3	0.731
Romantic relationship	5	0.754
Peer pressure	7	0.766
Teacher interaction	7	0.802
Future uncertainty	3	0.631
School/leisure conflict	5	0.772
Financial pressure	4	0.710
Emerging adults responsibility	3	0.570
Total	58	

3.7.4 Adolescent Stress Questionnaire (ASQ)

Many researches (Compas, Malcarne & Fondacaro, 1988; Compas, Connor-Smith, Saltzman, Thomsen & Wadsworth, 2001; Lupien, McEwen, Gunnar & Heim, 2009) have made concrete observations about the stress that affects adolescents and these studies have documented the effect of stress on adolescents' mental health. Some of the researchers have developed a set of questions to measure the stress level based on the

dimensions of the stressors that affect the adolescents, both in the research context and clinical context. The questionnaires thus developed have helped in measuring the anxiety and depression levels of respondents apart from the level of their self-esteem. These questionnaires are considered by most researchers and scholars as a reliable system for measuring adolescent stress. The development of the ASQ has been the result of research evaluating stressful life events experienced by adolescents and it was developed by Byrne & Mazanov (2002).

According to Almeida & McDonald (1998), parents who work during the week may have conflict with their children at home on weekends. According to the ASQ, the following items can be just as important in evaluating adolescents' stress level. It is believed that adolescence is a stage where cognitive, psychological and physical changes take place in a human being. It is the speed and magnitude of such changes (Jessor, 1993) that caused stress in adolescents (Byrne & Mazanov, 2002). The ASQ was developed to tackle issues which are connected to the methodologies used in calculating stress. Within the ASQ, there is also a list of stressors that caused stress. . The ASQ has been identified by many studies (Byrne, Byrne & Reinhart, 1995; Byrne & Mazanov, 2002) as being helpful in assessing adolescents' personal experiences with the most prominent issues that gave them stress being captured. Chronic stress affects adolescents later in adulthood and this can have an adverse effect on their physical and mental health later on in addition to various other problems they would face in their lifestyles due to the manifestation of health issues.

The ASQ is basically a list of items that was designed to assess common stressors that adolescents may experience in their daily lives. The intention of developing this questionnaire was to make sure that the list of stressors were based on adolescents' individual experiences. Also, the broader idea of the ASQ was to get the most important

item or items that were contemporary to the issues faced by young people at that time. Since the 1990's the scale has been developed based on focus groups with adolescents, their parents and their teachers (Byrne & Mazanov, 2002). There were 31 items in the first version and these reflected seven dimensions of the stressors that affect adolescents. Later on however, when the validation process involving the inventory was checked, it became clear that the ASQ was not as stable as was assumed and so relevant changes were addressed. Adolescents who participated in this process felt that the relevance of the items and the language used in the items were not contemporary in nature. They also commented on the fact that certain areas of enquiry could be added to make the process relevant such as by taking feedback from the adolescents. Consequently, the ASQ was revised and new items were added to the existing list and the language used in the items was adjusted to meet the ones used by the focus groups.

The original questionnaire was revised accordingly and now there are 58 items which have been proven to be of great use for making a complete and comprehensive measure of stress that includes both the research and clinical contexts (Byrne et al., 2007). Though there have been many adjustments made to the ASQ, it is still possible for researchers to make further changes as adolescents' stress can vary from country to country because of the cultural differences.

In this study, primarily two important factors were taken into account in addressing the effect of stress on the mental health of adolescents and they are the issues that generate stress in adolescents and the development and psychometric evaluation of these stressors. The adolescents who participated in this survey were in the safe hands of trained clinical psychologists who had developed a rapport with the participants and made them feel comfortable during the exercise of conducting the survey.

During the course of the exercise, participants' basic information like age, sex and year of schooling were collected. This helped in providing the demographic information (Appendix C). The ASQ used in this study had provided evidence which showed that there is a correlation between age and gender, and anxiety and depression. The ASQ had also helped to provide insight into understanding the relationship between emotional distress and stressors which in turn make the adolescents feel depressed and anxious.

The items that had created the stress in the participants were rated on a scale of 5 where marking 1 would indicate that the participants were not stressed by the item and when it progressed to 5, it would be an indication that a particular item can be very stressful. The items in the survey indicating stress covered the broad domain of adolescents' stressor experiences rather than on specific factors that dealt with stressor experience. In this regard, it is clear that the ASQ is an instrument that is broadly based thus allowing adolescents to state their experiences regarding a wide range of stressors. It also enabled the participants to state their experiences within the contexts which had shaped the psychological problems they experienced.

The participants were also measured in terms of the level of anxiety they were exposed to as a result of these stressors. The information gathered helped in ensuring the relevance and importance of the consequences of exposure to stress in adolescents. The ASQ is also beneficial in that it helped in enabling the depression level of these adolescents to be measured in a non-clinical way such that the assessment of the depressive mood was assessed on a scale ranging from never (0) to always (4). In the instrument, an adolescent's self-esteem was reported to be a very important factor that could help to ensure whether or not the individual felt stressed out due to the stressors. This was measured by using the Rosenberg Self-Esteem Scale (Rosenberg, 1965) which is a reliable 10-item questionnaire. Previously, there were no psychometric tests available to

measure stress levels in adolescents but with the advent of the ASQ, much of the issue was appropriately and systematically addressed. The ASQ can be used across any age span encompassing all adolescents; hence, it is a fairly reliable model to be applied for the evaluation of stress among adolescents.

Its reliability has been further enhanced and validated when it was applied on the Norwegian population. A study by Moksnes, Moljord, Espnes & Byrne (2010) used the ASQ (ASQ-N) on 723 Norwegian students. In their study, Principal Components Analysis (PCA) was used, and their results showed that nine dimensions of the ASQ were internally consistent. This built scale of the PCA was correlated to mental health outcomes such as depression, anxiety, and negative self-esteem. The findings also indicated that there was gender difference in the reporting of stressful life events. Girls reported higher stress levels than boys in seven of the nine scales. In addition, the findings also indicated that age was significant in the scale.

In the study of Moksnes, Byrne, Mazanov & Espnes (2010) it was mentioned that the stability of the ASQ needs to be tested repeatedly across cohorts and over time so as to establish the adequacy of use in adolescent studies. The information gathered from the current research regarding the use of the ASQ assessing adolescents' stress in the Kuala Lumpur region of Malaysia helps to answer that gap.

3.8 Study variables

In the current research, all of the variables used are listed in the Figure 3.5. The framework provides an illustration showing the connection between the variables. All the variables including dependent, independent, moderators, and mediators are listed accordingly. It needs to be mentioned that stress-level as a dependent variable consists of 9 categories, that all the sub-variables are listed as well.

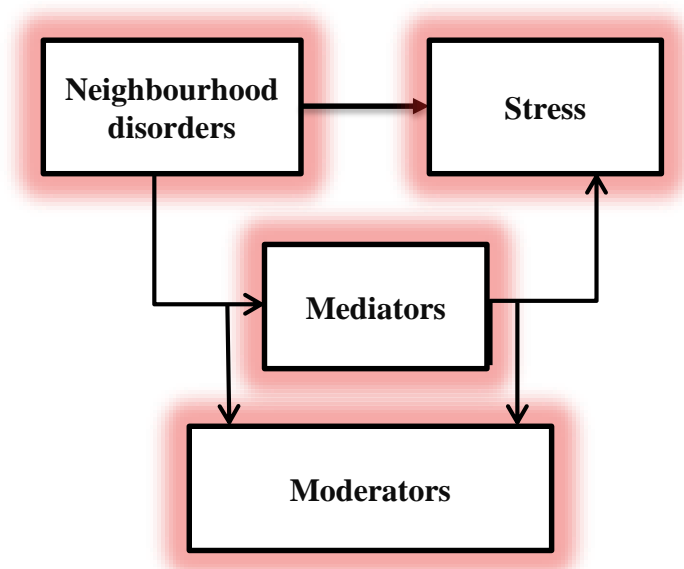


Figure 3.5: Study framework

3.8.1 Neighbourhood disorders (independent variables)

These are the list of variable used as independent variable in this study. As it is shown in Figure 3.5, neighbourhood disorders might lead to stress-level, which its related factors are social and physical disorders. All the other sub-variables of social and physical disorders are listed accordingly.

Social disorders

As has been stated above too, social disorders comprise several factors.

- People fighting
- Adult loitering
- Drinking in public
- Peer groups at street
- Drunken people
- Illegal sellers

Physical disorders

Likewise, physical disorders also comprise of a number of factors.

- Cigarette butts on the sidewalk
- Garbage, litter
- Empty beer bottles
- Graffiti on the walls
- Graffiti painted over
- Abandoned cars

3.8.2 Stressful life events (dependent variables)

According to study framework (Figure 3.5), neighbourhood might be related to stress.

Therefore, all sub-variables of stress-level (as dependent variables) are listed below.

1. Stress of Home life

- Disagreements between adolescent and father
- Disagreements between adolescent and mother
- Disagreements between parents
- Parents expecting too much from adolescent
- Parents hassling adolescent about the way he/she looks
- Not being taken seriously
- Little or no control over the life
- Abiding by petty rules at home
- Arguments at home
- Lack of trust from adults

2. Stress of School Performance

Similarly, stress at school too comprise of various factors.

- Having to study things they do not understand
- Teachers expecting too much from them
- Keeping up with school work
- Difficulty of some subjects
- Having to study things they are not interested in
- Pressure of study

3. Stress of School Attendance

- Going to school
- Compulsory school attendance
- Getting up early in the morning

4. Stress of Romantic Relationships

- Being ignored or rejected by a person they want to go out with
- Making the relationship work with their boyfriend/girlfriend
- Not enough time for their boyfriend/girlfriend
- Getting along with their boyfriend/girlfriend
- Breaking up with their boyfriend/girlfriend

5. Stress of Peer Pressure

- Being harassed for not fitting in
- Being judged by their friends
- Changes in their physical appearance with growing up

- Pressure to fit in with peers
- Satisfaction with how they look
- Peers harassing them about the way they look
- Disagreements between them and their peers

6. Stress of Teacher Interaction

- Disagreements between them and their teachers
- Not getting enough feedback on schoolwork in time to be helpful
- Teachers harassing them about the way they look
- Abiding by petty rules at school
- Not being listened to by teachers
- Lack of respect from teachers
- Getting along with their teachers

7. Stress of Future Uncertainty

- Concern about the future
- Putting pressure to meet the goals
- Having to make decisions about
- Future work or education

8. Stress of School/Leisure Conflict

- Not enough time to have fun
- Not enough time for leisure activities
- Too much homework
- Not enough time for activities outside school hours
- Lack of freedom

9. Stress of Financial Pressure

- Pressure to work to make money
- Not enough money to buy the things children want
- Having to take on new financial responsibilities as children grow older
- Not enough money to buy the thing children need

10. Stress of Emerging Adult Responsibility

- Work interfering with school and social activities
- Having to take on new family responsibilities as they get older
- Employers expecting too much of them

3.8.3 Moderators and mediators

As it was explained income moderators are factors may affect the association between neighbourhoods and stress. Age and gender are counted as mediators in this association. Likewise, mediators can change the association between neighbourhoods and stress and are changeable. These mediators included parental socioeconomic status (including family employments status, parental education, and family income), family functioning, transportation mode, neighbourhood satisfaction, individual character, and outdoor activities (if adolescents prefer to spend their time more indoor or outdoor).

3.9 Data Analysis

Upon collection, all data were keyed into the IBM SPSS software version 21. Data were screened to lessen the risk of missing data, outliers, and unengaged responses. Responses with missing data of more than 5% were completely deleted from the sheet. Responses with the exact same value or unengaged responses were found through the calculation of

Standard Deviation. Standard Deviation for 844 students was from 0.3 to 3.5 which showed a good variance in the responses. Outliers were found through the option of drawing a plot box in the SPSS and as it were also labelled by identity code; the outliers were identified and then removed. However, since the SPSS can also automatically ignore any missing data, in the context of this study, missing data were replaced with mean. After the clean data sheet was accomplished, data of 844 students were then analysed based on the research questions and objectives. They were then presented and discussed.

3.9.1 Parametric tests

In this study the relationships between stress-level and neighbourhood disorders with other factors such as age, gender, parental socioeconomic status, family functioning, individual preferences, and adolescents' general health analyses were taken.

This study uses parametric tests such as t-test and One-way ANOVA rather than nonparametric. The reasons for using parametric is that it can perform well with skewed and non-normal distributions, the spread of each group is different. This may be a surprise but parametric tests can perform well with continuous data that are not normal if these sample size guidelines become satisfied.

For this purpose, T-test and One Way ANOVA were implemented so as to find out whether or not the above items provided created any significant difference among adolescents in reporting the stress and neighbourhood disorders.

To analyse the presence of gender difference in reporting stress and neighbourhood disorders, the T-test was deemed to be the best since there were only two groups comprising males and females. T-test has the ability to test the mean difference for defining groups of males and females. For the rest of the factors, as there were more than two groups, One Way ANOVA was used. This method is able to answer whether or not

there was any difference between the groups in terms of particular factors. For example, T-test would show whether or not there is any difference between males and females in experiencing stress.

3.9.2 Justification for Multilevel analysis

Multilevel analyses allows the variability of outcomes to be examined both within neighbourhoods and across them. In this regard, it provides a more reliable estimates of the neighbourhood association to adolescent health outcomes. In general, the use of such an approach have found that neighbourhoods were internally quite heterogeneous and health outcomes tends to be more variable within neighbourhoods than across neighbourhoods (Elliott, Wilson, Huizinga, Sampson, Elliott & Rankin, 1996).

3.9.3 Analysis of neighbourhood disorder

The first research question as mentioned in chapter 1 was to investigate how adolescents perceive neighbourhood disorders in their neighbourhoods. Accordingly, the first objective stated in chapter 1 was to assess the adolescents' experiences and perceptions of neighbourhood disorders in urban neighbourhoods. To achieve this objective, data were analysed in the following steps. 1) Measuring the internal consistency, sample adequacy, and validity of neighbourhood disorders' items in the questionnaire. 2) Comparison of the average of each item in questionnaire and the average of social or physical disorders for both experience and perception.

For the first step, using the SPSS, factor analysis method and the internal consistency of validity were assessed. Factor analysis is a collection of methods for explaining the correlation among variables in terms of more fundamental units called factors (Cudeck, 2000). Factor analysis also attempts to bring inter-correlated variables together under more general, underlying variables. More specifically, the goal of factor analysis was to reduce "the dimensionality of the original space and to give an interpretation to the new

space, spanned by a reduced number of new dimensions which are supposed to underlie the old ones” (Rietveld & Van Hout, 1993). Alternatively, factor analysis is used to explain the variance in the observed variables in terms of underlying latent factors. From this, it can be seen that factor analysis offers not only the possibility of gaining a clear view of neighbourhood disorders and stress-level but also the possibility of using these results in subsequent analyses. However, in factor analysis, the number of samples can be just as important. In the SPSS, Kaiser-Meyer-Olkin measure of sampling adequacy (KMO-test) was used to check whether the sample is big enough. In this study, the value of 0.931 shows a great sample adequacy.

3.9.4 Analysis of stressful life events

The second research question investigates what would be the adolescents’ stress level as reported by them. The related objective was to assess the adolescent’s self-reported stress-levels. To achieve the second objective, factor analysis was also used to assess the validity of the questionnaire, internal consistency of the items, and adequacy of sample. The presented results showed the factors that were loaded onto factor analysis while frequency analysis introduced the top stressors as reported by adolescents in the Kuala Lumpur region of Malaysia.

3.9.5 Association between neighbourhood disorders and stress

The third research question was to investigate whether or not there is any association between neighbourhood disorders and adolescents’ self-reported stress and the related objective was to assess the association between neighbourhood social and physical disorders and their stress levels as perceived by the adolescents.

In this regard, the Pearson correlation coefficient often shortened to Pearson correlation or Pearson's r was used. It is a measurement of strength and direction of association that exists between two continuous variables. The Pearson correlation generates a coefficient

called the Pearson correlation coefficient, which is denoted as r . In the current research Pearson's r draws a line of best fit through the data of neighbourhood social and physical disorders and stress-level. The Pearson correlation coefficient, r , indicates how far away all these data points were to this line of best fit (i.e., how well the data points fit this new model/line of best fit). Its value can range from -1 for a perfect negative linear relationship to +1 for a perfect positive linear relationship. However, a value of 0 (zero) would indicate no relationship between two variables.

3.9.5.1 Multivariate analysis

For further analysis of the third objective, multivariate linear regression was used to test whether or the effectiveness of neighbourhood disorder on stress-level would be changed by other factors including age, gender, parental socioeconomic status, family functioning, individual preferences, and adolescents' general health. In this research five models were tested as follows and upon completion, one was introduced as the final model that can help to develop a better understanding of the association between neighbourhood disorders and stress-level. These models for testing the dependent variable of stress are as follows.

Model 1. Neighbourhood Disorder

Model 2. Neighbourhood Disorder and Family Functioning

Model 3. Neighbourhood Disorder, Family Functioning, and SES

Model 4. Neighbourhood Disorder, Family Functioning, SES, and Demographic factors

Model 5. Neighbourhood Disorder, Family Functioning, SES, Demographic factors, and Individual preference (indoor/outdoor preferences, neighbourhood satisfaction)

The association between neighbourhood disorders and stress tested for each model and the results acquired are presented in chapter four of this study.

3.9.6 Spatial analysis of neighbourhood disorders and stress

3.9.6.1 Moran's I

Several tests of global autocorrelation are available beginning with the Moran's I as the most common (Fotheringham, Brunsdon & Charlton, 2000). Positive values of the Moran's I with significant p values would suggest that high values in region i tend to depend on values in adjacent regions j (i.e., higher values will cluster in space with other high values and vice versa). Negative values would suggest that high values tend to associate with low values which are similar to a checkerboard pattern.

Moran's I , as one of the many statistical methods of finding significance of spatial distributions, has been used in previous studies to find the correlation of neighbourhoods and depressive systems as well (Cromley, Wilson-Genderson & Pruchno, 2012). Related to that is global spatial autocorrelation which can identify whether or not the distributions of outcomes is significant. For example, the study mentioned above showed the significance of distribution of depression across urban areas when the Moran's I was used. This was used as a proof to show the importance of urban neighbourhoods which can affect mental health outcomes. With this method, the question of whether neighbourhoods with high-level/ low-level of stress are clustered or not can be answered.

Regarding the Moran's I score, it can be said that the score varies from -1 to +1. The positive value is a sign that neighbourhoods with similar stress-levels or with similar disorders are located next to each other or together. Adversely, a statistically significant score illustrates that some residents reported higher or lower stress than their neighbours.

However, as is common with all methods, Moran's I method also contain some limitations. For instance, there is no illustration for the location of clustered neighbourhoods, and additionally, only the status of significant distribution can be

reported. Therefore, other method was used in order to identify the locations of clustering neighbourhoods.

Moreover, various possibilities are involved when considering correlation at the local level. This means that correlation can be illustrated in either areas with high-disorder or less-disorder neighbourhoods whether clustered or not. This method nonetheless, shows the outcome in terms of low-to-low, high-to-high, low-to-high, and high-to-low disorder. In the ArcGIS, this method can be found with the name of “Local Indicators of Spatial Association” (LISA). Indeed, it has the capability to located areas with either same outcomes, or opposite outcomes. In this method, the average of the stress-level of the participants was given to their neighbourhood in ArcGIS, then through LISA neighbourhoods with the same value were clustered.

3.9.6.2 LISA (*Local Indicators of Spatial Association*)

After finding the significance of spatial distributions of stress across urban neighbourhoods, LISA is used to search for the clustering pattern of stress across the city. It is also used in order to detect which neighbourhoods have low or high disorders and which are close together. The formula used in the LISA method is as follows:

$$I_i = Z_i + \sum_{i \neq j}^{\infty} W_{ij} Z_j$$

Where:

Z_i = the score of the perceived stress in area i,

Z_j = deviations from the mean, and

W_{ij} = spatial weights measuring the nearness of areas i and j.

The outline over j is such that only scores for neighbouring areas were calculated. LISA essentially measures the statistical correlation between the score in neighbourhood i with the score in nearby neighbourhoods. Regarding the scoring, the value near zero shows that there is no statistically significant correlation between neighbouring areas. Positive value illustrates that areas with low or high stress-level are close together. And finally the negative value demonstrates areas with high and low stress that were close together. The ArcGIS 10.2 is used to implement the data and measures and to calculate the Moran's I , and also to compute LISA statistics.

SUMMARY

In this chapter the methods and techniques used in selecting the samples, collecting the data and analysing them are explained. It was mentioned that this research used mixed sample selection. In the procedure, it was mentioned that 24 out of 96 schools were randomly selected from five different residential zones in Kuala Lumpur based on the stratified sampling method. It was also highlighted that from each school 9 different classes were randomly selected and all the students in each class were invited to participate in the study. Consent letter along with parental forms were given to students for them to take home. Those with completed parental consent letters were then instructed to fill two forms. One was related to self-reporting of stressful life events and the other was related to neighbourhood disorders. A total number of 844 students with completed forms participated in the study.

The chapter also indicated that data were analysed in six steps. First, through the IBM SPSS 21 descriptive analysis comprising factors encompassing age, gender, ethnicity, mode of transportation, neighbourhood satisfaction, preferences of outdoor activities, family functioning, general health status, and socioeconomic status. Second, it was mentioned that neighbourhood disorders variables were analysed through factor analysis.

The association between neighbourhood social and physical disorders and other factors such as age, gender, socioeconomic status, family function, individual characteristics were also analysed. Third, the same method was applied for measuring stress-levels. The association between stress-level and other factors such as age, gender, socioeconomic status, family function, individual characteristics was also examined. Forth, through using regression analysis the association between neighbourhood and stress was also analysed. Fifth, using multivariate analysis highlighted how other factors affect this association. Finally, using the ArcGIS, the distribution of stress-level and neighbourhood social and physical disorders was illustrated. Sixth, the location of participants with high level of stress, experiences and perceptions of neighbourhood disorders, lower family functioning was identified.

CHAPTER 4: RESULTS

This chapter is divided into four main sections. Section one explains the baseline information and socio-demographic data. Section two discusses the first objective which shows the result of perceptions of neighbourhood social and physical disorders by adolescents. For further analysis, the association between neighbourhood social and physical disorders and other factors are also presented. Section three shows the results of stress-level assessment that is pertaining to the second objective. In addition, the association between stress and the other factors were also presented in this section. Section four discusses the third objective that is the association between stress and neighbourhood disorders is shown. Results of multivariate analysis and the suggested pathways of the association between neighbourhood and stress are also illustrated in this section. Among the five different pathways identified, one has been finalized as being the most effective pathway in explaining the association between neighbourhood disorder and adolescents' stress. At the end of section four, the results of spatial analysis the association between neighbourhood and stress are also illustrated.

4.1 Baseline Information

This section presents the results of the demographic data, parental socioeconomic status, family functioning, general health status, and individual preferences of adolescents living in their neighbourhoods.

4.1.1 Demography

The participants of the current research comprise adolescents from 62 neighbourhood areas located in Kuala Lumpur, Malaysia. The descriptive statistics (Table 4.1) show that majority of the respondents were females (57.2% and 42.8% male). The mean age of the

participants were 14.08 (± 0.835). Most of them were Malay (45.3%), followed by Chinese (31.5%) and Indian (17.1%).

Table 4.1: Demographic characteristics of participants

(n = 844)	n	%
<i>Age; M = 14.08, SD = 0.83</i>		
13	331	39.2
14	256	30.3
15	257	30.5
<i>Gender</i>		
Female	483	57.2
Male	361	42.8
<i>Ethnicity</i>		
Malay	382	45.3
Chinese	266	31.5
Indian	144	17.1
Others	52	6.2

4.1.2 Socioeconomic status

As has been mentioned before, socioeconomic status data have been collected from students' parents through a survey. In the income category, as is presented as table 4.2, responses are divided into three categories which include low, medium, and high income and the percentages were 34.6%, 41.4%, and 18.6% respectively. This indicates that majority of the respondents were from the low and medium income groups with a monthly salary of below RM1999, and between RM1999 and RM3499 respectively. The monthly salary of the high income category is RM3500 and above.

Regarding the employment status, majority of the parents were employed fulltime (44.9%), followed by unemployed (31.0%) and part time employed (18.6%). Data related to parental education highlight maternal and paternal education status. The ratio of this data is consistent with the Education Status of Malaysia. Majority of the respondents had both mothers and fathers who had education at the secondary school level, either lower secondary or upper secondary. Table 4.2 shows the percentage of mothers with secondary

school education being higher (74.1%) than fathers (69.0%). Adversely, the percentage of fathers with tertiary level was higher (18.8%) than mothers (11.6%). The results also show that nearly 1.5% of both parents do not have formal education.

Table 4.2: Descriptive results of socioeconomic status

(n = 844)	n	%
<i>Income</i>		
Low	292	34.6
Medium	349	41.4
High	157	18.6
Refused	46	5.5
<i>Employment status</i>		
Unemployment	262	31.0
Part-time	157	18.6
Full time	379	44.9
Refused	46	5.5
<i>Paternal education</i>		
No formal education	12	1.4
Primary	45	5.3
Secondary	582	69.0
Tertiary	159	18.8
Refused	46	5.5
<i>Maternal education</i>		
No formal education	13	1.5
Primary	62	7.3
Secondary	625	74.1
Tertiary	98	11.6
Refused	46	5.5

4.1.3 Family functioning

The items related to the factor of family functioning include (1) sharing ideas or talking about things that really matter, (2) coping with day to day demands of parenthood or raising child/children, (3) getting harder to care for than most children, (4) child does things that really bother parents a lot, (5) feeling angry with the child/children, and (6) presence of someone whom parents can turn to for day-to-day emotional help with

parenthood/raising children. The Figure 4.1 shows different aspects of family functioning and the percentages of parental report.



Legend

- Parents can handle very well
- Parents can handle somewhat well
- Parents can handle not very well
- Parents can handle not well at all

Figure 4.1: Parental report of family functioning

Among all the items listed, it appears that “coping with the children demands”, “caring of them”, “being bother by children acts”, and “emotional help for the day-to-day demand of caring of child” were items that parents could handle “very well”. All of the percentages supporting these factors were above 30%. However, “feeling angry about children” and “sharing ideas” were items which parents could handle “somewhat well”. Here, it needs to be mentioned that among all of the items provided, the one on “feeling angry” was the only item that seems to be challenging for parents to handle.

As shown in Table 4.3, majority of the parents reported that “they can share the idea somewhat well with their child” and this is followed by around 35% of them who reported “share the idea very well”. Regarding the item of “coping with day to day demands of parenthood”, majority of the parents reported they could handle it “very well” and “somewhat well” and the percentage was 46.2% and 38.3% respectively. This finding seems to resonate similarly for other items such as “hardship of caring child”, “being bother by child”, and “emotional support from others”. However, the results are slightly different when it is at the item of “feeling angry with child”. Majority of the parents reported that they could handle it “not very well” and “somewhat well”. Less than 5% of the parents reported that they could handle the functions “not well at all”. This finding seems to suggest that the item could be the most problematic factor of family functioning.

Students’ general health status

Statistics of the health report submitted by parents are given in Table 4.4 which summarises the opinions parents made on various factors of health like (i) the overall health status of the participants, (ii) factors limiting the children’s ability to do things, (iii) need for additional medical care, mental health, or educational services, (iv) medical conditions for the last 12 months or more and (v) the need for medicines other than vitamin supplements.

There seems to be a clear indication that 20.4% of the participants are in “good general health” while others state that they are in ‘very good’ and ‘excellent’ health and this is accounted for by 18.2% and 10.1 % respectively (Figure 4.2)

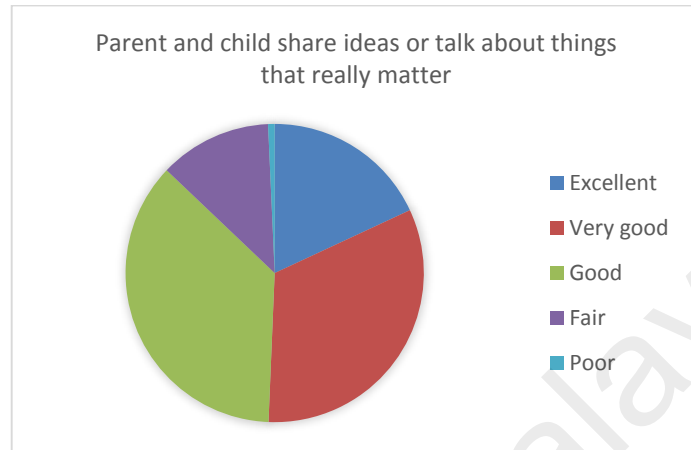


Figure 4.2: Adolescents general health status

The data extracted from the current research also show that 80.3% of the children do not need “medical care, mental health, or educational services” and only 9.1% of the participants reported that they need additional care and services. Within this research, a small percentage (14.5%) of children were reported to have some medical conditions that has lasted for a year or more. While majority do not need “medicine prescribed by a doctor care other than vitamins” (72.3%), a considerable percentage (22.6%) of the children need prescribed medicines (Table 4.3).

Table 4.3: Parents’ report of children health status

<i>Items (n = 844)</i>	<i>n</i>	<i>%</i>
<i>Child limited or prevented in any way in [his/her] ability to do the things most children of the same age can do</i>		
Yes	157	18.6
No	578	68.5
Refuse	109	12.9
<i>Child need or use more medical care, mental health, or educational services than is usual for most children of the same age</i>		
Yes	77	9.1
No	678	80.3
Refuse	89	10.5

<i>There is a condition that has lasted or is expected to last 12 months or longer</i>		
Yes	122	14.5
No	452	53.6
Refuse	270	32.0
<i>Child currently need or use medicine prescribed by a doctor, other than vitamins</i>		
Yes	191	22.6
No	610	72.3
Refuse	43	5.1

4.1.4 Individual factors

Participants of the study have also indicated the challenges they experience in their neighbourhood with regard to the neighbourhood satisfaction and outdoor recreation (Table 4.4).

Table 4.4: Students' report about the transportation mode and playing out-door.

<i>Item (N = 844)</i>	<i>n</i>	<i>%</i>
<i>Neighbourhood satisfaction</i>		
Yes	476	56.4
No	263	31.2
Don't know	105	12.4
<i>Outdoor play</i>		
Yes	161	19.1
No	523	62.0
Sometimes	108	12.8
Always	52	6.2

Statistics indicating opportunities and threats are shown below. Out of the 844 participants being surveyed, more than half of them were satisfied with their neighbourhood (56.4%). Over half of the participants reported that they did not enjoy outdoor recreation or play outside (62%). A small percentage (6.2%) reported that they always play outside their homes while 12.8% reported playing outside sometimes.

4.2 Neighbourhood disorders

The second section of chapter four presents results which assess the experiences and perceptions of neighbourhood disorders as reported by the adolescents. This is followed by a discussion on the association between neighbourhood disorders and other factors including age, gender, parental socioeconomic status, parental functioning, and general health status, and individual preferences.

4.2.1 Adolescents' experiences and perceptions of neighbourhood disorders

Neighbourhood disorders have been divided into two main categories. The first one talks about the experience of disorders and the second one is related to perceptions of those disorders. The results drawn from the current research show that the mean of experiences of physical disorders have the highest rate ($M = 13.88, \pm 3.71$)(Table 4.5).

Table 4.5: Neighbourhood factor analysis

Items (n=844)	Weighted Mean (%)	SD
Experience of physical disorder	56.85	0.50
Experience of social disorder	42.83	0.40
Perception of physical disorder	43.81	0.59
Perception of social disorder	46.43	0.61

The above mentioned rate was extracted out of 100 total scores (weighed mean) listed for experiences and perceptions of neighbourhood social and physical disorders. In the experiences of social disorders, it appears that it has the lowest rate ($M = 42.83, SD = 0.4$). Total neighbourhood disorders as perceived by adolescents both socially and physically was scored. Table 4.6 shows factor loading of all the items in the experienced and perceived neighbourhood disorder scale as used in the current research. Factor

loading showed the distinction between experiences and perceptions of both neighbourhood social and physical disorders.

Table 4.6: Factor loadings of neighbourhood disorder

Items	Factor loadings
<i>Experience of social disorders</i>	
Adults loitering/hanging out on the block face	0.647
Drunken or otherwise intoxicated people	0.346
Any robbery or fight in your neighbourhood	0.345
People drinking alcohol openly on the street	0.324
Illegal selling	0.231
<i>Experience of physical disorders</i>	
Graffiti on buildings, signs or walls	0.697
Cigarette on the sidewalk or in gutters	0.627
Evidence of graffiti that has been painted over	0.613
Garbage, litter, or broken glass in the street or on the sidewalks	0.582
Abandoned cars	0.545
Empty beer visible in streets, yards, or alleys	0.533
<i>Perceptions of social disorders</i>	
Seeing drunken or otherwise intoxicated people	0.772
People drinking alcohol openly on the street	0.739
Illegal selling	0.655
Adults loitering on the block face	0.629
Characterizing the peer group(s) as a gang	0.615
Any robbery or fight in the neighbourhood	0.557
<i>Perceptions of physical disorders</i>	
Empty beer visible in streets, yards, or alleys	0.721
Evidence of graffiti that has been painted over	0.689
Graffiti on buildings, signs or walls	0.667
Cigarette on the sidewalk or in gutters	0.645
Garbage in the street or on the sidewalks	0.631
Abandoned cars	0.506

4.2.2 Neighbourhood disorders and other factors

The mean difference between other factors in the experiences and perceptions of neighbourhood disorders was further considered in the following paragraphs.

4.2.2.1 Age and Gender

The results of the mean difference as shown in the experiences and perceptions of neighbourhood social and physical disorders among age groups are indicated in Table 4.7. In looking at gender, no statistically significant differences were detected between males and females as determined by T-test in the experiences of physical disorder ($F(842,758) = 0.01, p = 0.89$), experiences of physical disorder ($F(842,770) = 0.18, p = 0.66$), perceptions of physical disorder ($F(842,774) = 0.06, p = 0.665$), and perceptions of social disorders ($F(842,776) = 0.16, p = 0.68$).

Table 4.7: Significant difference among adolescents' age in experiences and perceptions of neighbourhood social and physical disorders

	$F(3, 841)$	p
Experience of neighbourhood social disorder	6.04	0.00*
Experience of neighbourhood physical disorder	3.58	0.02*
Perceptions of neighbourhood social disorder	1.66	0.19
Perceptions of neighbourhood physical disorder	6.20	0.02*

*Difference is significant with p values of less than 0.05

Figure 4.3 illustrates the mean difference looking at the experience and perceptions of neighbourhood disorders. Data show that adolescents aged 15 reported higher levels of disorders which were either perceived or experienced. However, there was no difference between the different ages in perceptions of neighbourhood social disorders.

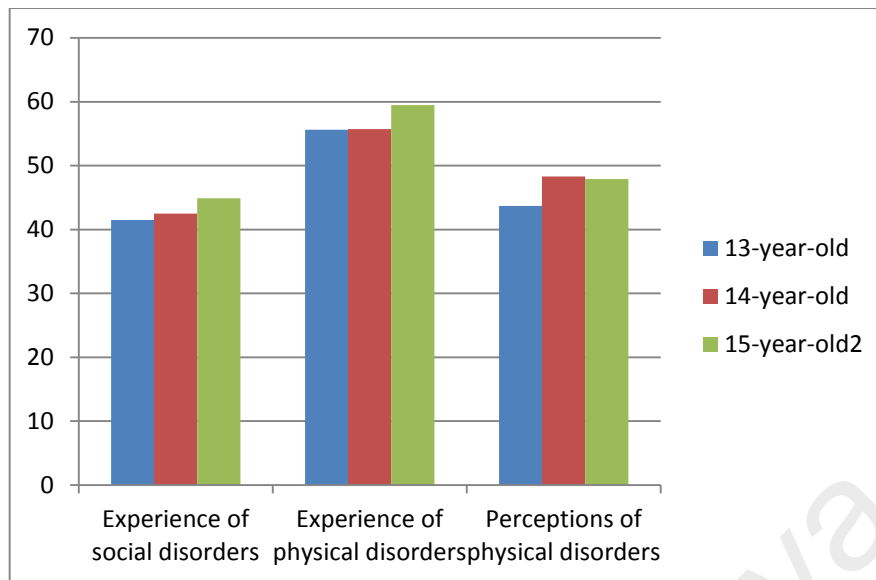


Figure 4.3: Mean difference in the experiences and perceptions of neighbourhood disorders among different age.

4.2.2.2 Socioeconomic status

The Table 4.8 shows whether or not there is any significant difference between different income groups in the experiences and perceptions of neighbourhood disorders. Accordingly, the chart below illustrates the mean difference of different income groups.

Table 4.8: Significant difference among family income in experiences and perceptions of neighbourhood social and physical disorders

Family Income	$F(4, 840)$	p
Experience physical	9.67	0.00*
Experience social	21.45	0.00*
Perception physical	13.33	0.00*
Perception social	14.32	0.00*

*Difference is significant with p values of less than 0.05

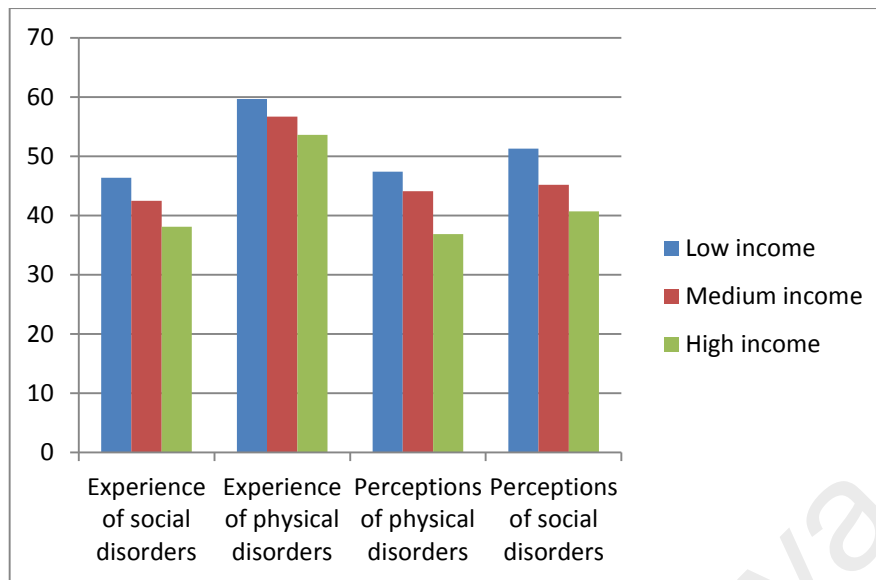


Figure 4.4: Mean difference in the experiences and perceptions of neighbourhood disorders among different income groups.

As can be seen, Table 4.9 and Figure 4. 5 illustrate the status of differences between three different groups including parents who have tertiary, secondary, or primary level of formal education.

Table 4.9: Significant difference among family education in experiences and perceptions of neighbourhood social and physical disorders

Maternal education	<i>F</i> (5, 839)	<i>p</i>
Experience physical	2.47	0.04*
Experience social	3.29	0.01*
Perception physical	3.75	0.00*
Perception social	3.30	0.01*

*Difference is significant with *p* values of less than 0.05

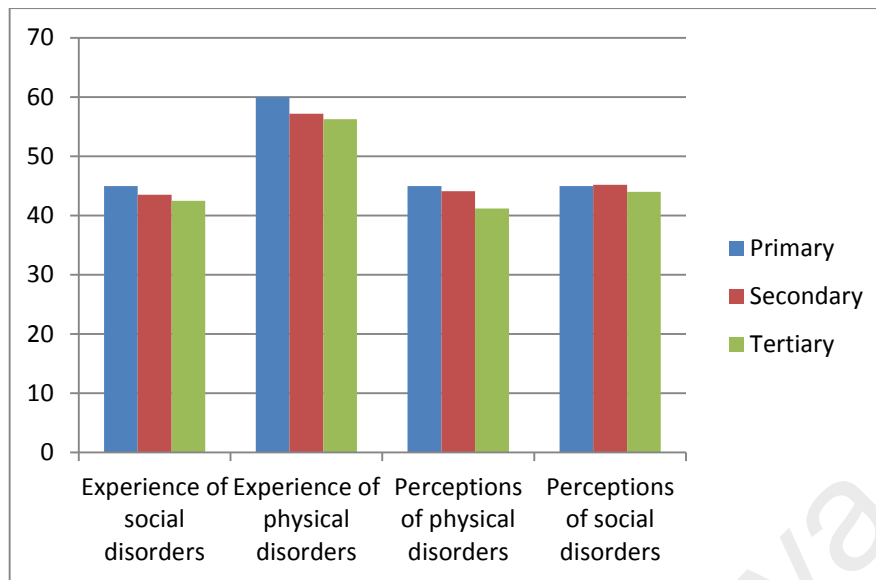


Figure 4.5: Mean difference in the experiences and perceptions of neighbourhood disorders among different status of parental education

In looking at the family employment status, Table 4.10 and Figure 4.6 show the status of differences between families with different employment status. Results indicate that adolescents with unemployed families reported higher level of disorders than others.

Table 4.10: Significant difference among family employment status in experiences and perceptions of neighbourhood social and physical disorders

Maternal education	<i>F</i> (4, 840)	<i>p</i>
Experience physical	7.84	0.00*
Experience social	16.55	0.00*
perception physical	10.39	0.00*
perception social	14.62	0.00*

*Difference is significant with *p* values of less than 0.05

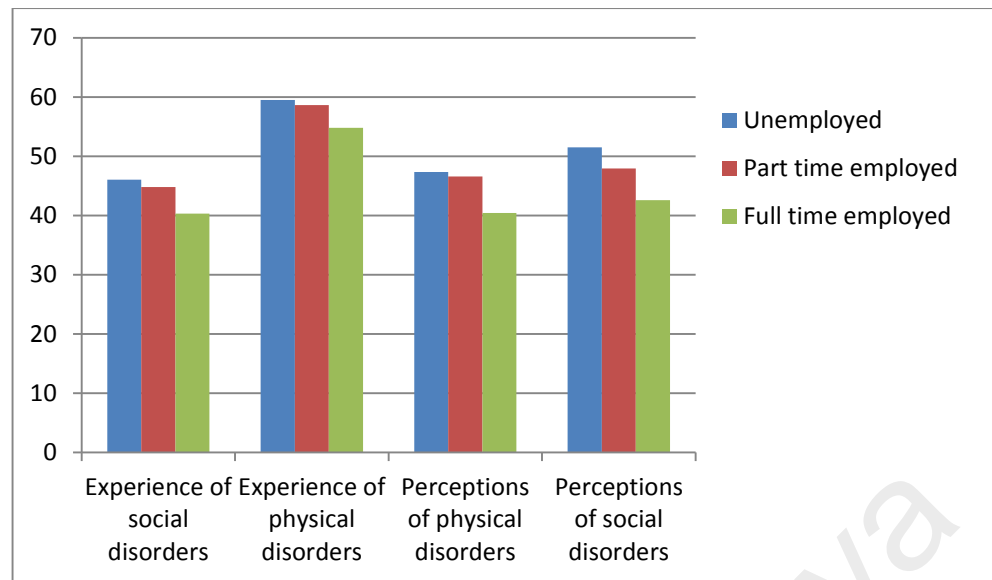


Figure 4.6: Mean difference in the experiences and perceptions of neighbourhood disorders among different family employment status

4.2.2.3 Neighbourhood Satisfaction

The adolescents were asked whether or not they were satisfied with the neighbourhood environment they are in. Interestingly, there was a statistically significant difference between adolescents' satisfaction level in their experiences of social disorders ($F(2,841) = 4.242, p = 0.01$) which was determined by one-way ANOVA. A Tukey post-hoc test revealed that adolescents who were not satisfied had experienced more social disorders ($M = 43.66 \pm 11.27$ score, $p = 0.02$) than those who were satisfied ($M = 41.86 \pm 12.00$). There was no statistically significant difference between adolescents' satisfaction in their experiences of physical disorders ($F(2,841) = 0.794, p = 0.45$) and perceptions of social disorders ($F(2,841) = 2.338, p = 0.09$) and perceptions of physical disorders ($F(2,841) = 1.903, p = 0.15$) as determined by one-way ANOVA.

4.2.2.4 Preference of outdoor environment

There was a statistically significant difference between adolescents with different preferences of outdoor environment and their experiences of social disorders ($F(3,840) = 10.252, p = 0.00$) as determined by one-way ANOVA. A Tukey's post-hoc revealed that respondents who do not prefer outdoor environment experienced less social disorder

($M = 41.40 \pm 12.25$ score) as compared to those who preferred outdoor often ($M = 46.29 \pm 12.61$ score, $p = 0.00$) or very often ($M = 49.27 \pm 13.9$ score, $p = 0.00$).

There was a statistically significant difference between adolescents with different preferences of outdoor environment and their experiences of physical disorders ($F(3,840) = 7.437, p = 0.00$) as determined by one-way ANOVA. A Tukey's post-hoc revealed that respondent who did not prefer outdoor environment experienced less physical disorder ($M = 54.94 \pm 16.02$ score) as compared to those who preferred outdoor very often ($M = 64.50 \pm 16.10$ score, $p = 0.00$).

There was no statistically significant difference between adolescents with different preferences of outdoor environment and their perceptions of social disorders ($F(3,840) = 0.877, p = 0.45$) and physical disorders ($F(3,840) = 1.061, p = 0.36$) as determined by one-way ANOVA.

4.2.2.5 Family functioning

There was statistically significant difference between adolescents who had different family functioning in their experiences of social disorder ($F(3, 340) = 8.119, p = 0.00$) as determined by one-way ANOVA. A Tukey's post hoc revealed that experiences of social disorder is higher for those whose parents could not handle the role very well (45.28 ± 13.28 score) as compared to those whose their parents acted very well ($M = 41.47 \pm 11.30$ score, $p = 0.01$) or acted somewhat well ($M = 41.98 \pm 11.35$ score, $p = 0.00$).

There was statistically significant difference between adolescents who had different family functioning in their experiences of physical disorder ($F(3, 340) = 2.863, p = 0.03$) as determined by one-way ANOVA. A Tukey's post hoc revealed that experiences of social disorder is higher for those whose parents could not handle their roles very well

(59.21 ± 14.76 score) as compared to those whose parents acted somewhat well ($M = 56.13 \pm 14.56$ score, $p = 0.07$).

There was statistically significant difference between adolescents who had different family functioning in their perceptions of physical disorder ($F(3, 340) = 2.649, p = 0.04$) as determined by one-way ANOVA. A Tukey's post hoc revealed that experiences of social disorder is higher for those whose parents could not handle their role very well (46.28 ± 18.77 score) as compared to those whose parents acted somewhat well ($M = 42.54 \pm 16.51$ score, $p = 0.06$).

There was no statistically significant difference between adolescents who had different family functioning in their perceptions of social disorder ($F(3, 340) = 1.502, p = 0.21$) as determined by one-way ANOVA.

4.2.2.6 General health status

Parents were asked about the health status of their children for example if their children required any medicine or special care. Results showed that there was a statistically significant difference between different adolescents' health condition in experiences of social disorders ($F(5, 838) = 9.935, p = 0.00$) as determined by one-way ANOVA. A Tukey's post hoc revealed that adolescents who had poor health condition reported higher level of social disorders ($M = 59.72 \pm 23.96$ score,) as compared to those who have excellent health conditions ($M = 39.97 \pm 9.12$ score, $p = 0.00$) or conditions reported as very good ($M = 41.31 \pm 10.42$ score, $p = 0.00$) or good ($M = 43.34 \pm 12.51$ score, $p = 0.00$).

There was a statistically significant difference between different adolescents' health condition in experiences of physical disorders ($F(5, 838) = 6.528, p = 0.00$) as determined by one-way ANOVA. A Tukey's post hoc revealed that adolescents who had poor health

conditions reported higher levels of social disorders ($M=74.30 \pm 22.26$ score,) as compared to those who have excellent health condition ($M=55.58 \pm 14.86$ score, $p = 0.02$) or conditions which were very good ($M = 55.12 \pm 12.90$ score, $p = 0.01$) or good ($M = 56.54 \pm 14.76$ score, $p = 0.03$).

There was a statistically significant difference between different adolescents' health condition in experiences of physical disorders ($F(5, 838) = 2.881, p = 0.01$) as determined by one-way ANOVA. A Tukey's post hoc revealed that adolescents who had fair health conditions reported higher level of social disorders ($M = 48.51 \pm 19.92$ score) as compared to those who have very good health condition ($M = 42.50 \pm 15.47$ score, $p = 0.03$).

There was no statistically significant difference between different adolescents' health condition in perceptions of social disorders ($F(5, 838) = 1.780, p = 0.11$) as determined by one-way ANOVA.

The summary of the group differences are as follows. It has been shown that perceptions of social disorders were not significant for the outdoor preferences, family functioning, and neighbourhood satisfaction. Experiences and perceptions of neighbourhood social and physical disorders were not totally significant for males and females. This summary is illustrated in Table 4.11.

Table 4.11: Summary of significant difference in the experiences and perceptions of neighbourhood disorders

	Experiences social disorders	Experience physical disorders	Perceptions of social disorders	Perceptions of physical disorders
Age	√	√	√	√
Gender	-	-	-	-
Parental Income	√	√	√	√
Parental	√	√	√	√
Employment	√	√	√	√
Maternal	√	√	√	√
education				
Paternal	√	√	√	√
education				
Outdoor	√	√	-	√
preference				
Neighbourhood	√	√	-	√
satisfaction				
Transportation	√	√	√	√
mode				
Family	√	√	-	√
functioning				
Health status	√	√	-	√

4.3 Findings of stress-level assessment

In the third section, results indicating the assessment of stress-levels, and its association with the other factors such as age, gender, parental socioeconomic status, family functioning, individual character, and general health status are presented.

4.3.1 Adolescent stress-level

The results of this study show that the average of stress-level among adolescents is 44.39% (± 33.6). Table 4.12 presents the results extracted from the Principal Component Analysis (PCA) and the associated variance of each dimension with items being number loaded onto factors. Seven items that did not load on any factors were excluded from the factors and scale scores. These items were 5, 13, 14, 15, 18, 25, 50 with loading < 0.30 . The final scale consisted of ten factors and 51 items which help to explain 56% of the variance. The internal consistency of the scales ranged from 0.70 to 0.89 for adults' responsibility stress and home life stress respectively. However, all of the items had the internal consistency of above 0.70. This illustrates the good internal consistency for all factors.

Table 4.12: Factor loading of ASQ

Factors		Related Category
<i>Factor 1 - Stress of Home Life</i>		
Item 29	.737	F1: Stress of Home Life
Item 37	.729	F1: Stress of Home Life
Item 31	.685	F1: Stress of Home Life
Item 01	.646	F1: Stress of Home Life
Item 48	.553	F1: Stress of Home Life
Item 35	.471	F1: Stress of Home Life
Item 49	.456	F1: Stress of Home Life
Item 21	.438	-
Item 02	.427	F1: Stress of Home Life
Item 44	.412	F1: Stress of Home Life
<i>Factor 2 - Stress of School Performance</i>		
Item 39	.767	F3: Stress of School Attendance
Item 33	.764	F3: Stress of School Attendance
Item 43	.578	F2: Stress of School Performance
Item 09	.544	F2: Stress of School Performance

Continued

Item 03	.522	F3: Stress of School Attendance
Item 42	.490	F6: Stress of Teacher Interaction
Item 57	.448	F6: Stress of Teacher Interaction

Factor 3 - Stress of School/Leisure Conflict

Item 23	.624	F8: Stress of School/Leisure Conflict
Item 24	.601	F8: Stress of School/Leisure Conflict
Item 19	.551	F8: Stress of School/Leisure Conflict
Item 26	.509	F8: Stress of School/Leisure Conflict
Item 16	.500	F2: Stress of School Performance
Item 20	.473	F7: Stress of Future Uncertainty
Item 12	.462	F2: Stress of School Performance

Factor 4 - Stress of Teacher Interaction

Item 54	.668	F5: Stress of Peer Pressure
Item 55	.613	F6: Stress of Teacher Interaction
Item 45	.559	F6: Stress of Teacher Interaction
Item 41	.549	F6: Stress of Teacher Interaction
Item 56	.514	F5: Stress of Peer Pressure
Item 53	.410	F8: Stress of School/Leisure Conflict

Factor 5 - Stress of Emerging Adult Responsibility

Item 06	.606	F2: Stress of School Performance
Item 46	.577	F1: Stress of Home Life
Item 11	.560	F10: Stress of Emerging Adult Responsibility
Item 10	.559	F10: Stress of Emerging Adult Responsibility

Factor 6 - Stress of Future Uncertainty

Item 47	.555	F9: Stress of Financial Pressure
Item 07	.540	F7: Stress of Future Uncertainty
Item 34	.511	F7: Stress of Future Uncertainty

Factor 7 - Stress of Romantic Relationships

Item 40	.770	F4: Stress of Romantic Relationships
Item 52	.733	F4: Stress of Romantic Relationships
Item 27	.663	F4: Stress of Romantic Relationships
Item 58	.600	F4: Stress of Romantic Relationships
Item 17	.450	F4: Stress of Romantic Relationships
Item 22	.448	F9: Stress of Financial Pressure

Factor 8 - Stress of Peer Pressure

Item 36	.555	F5: Stress of Peer Pressure
Item 30	.552	F5: Stress of Peer Pressure
Item 32	.498	F5: Stress of Peer Pressure
Item 28	.462	F5: Stress of Peer Pressure

Factor 9 - Stress of Life

Item 04	.542	F1: Stress of Home Life
Item 08	.510	F5: Stress of Peer Pressure

Continued

Factor 10 - Stress of Financial Pressure

Item 51	.754	F9: Stress of Financial Pressure
Item 38	.693	F9: Stress of Financial Pressure

Unloaded Factors

Item 18	.754	F6: Stress of Teacher Interaction
Item 13	.693	F1: Stress of Home Life
Item 05	.754	F2: Stress of School Performance
Item 14	.693	F2: Stress of School Performance
Item 25	.754	F6: Stress of Teacher Interaction
Item 50	.693	F10: Stress of Emerging Adult Responsibility
Item 15	.754	F15: -

The test-retest reliability was conducted one week after the pre-test and a re-test was then conducted among the sub-sample of 30 students. Results indicate that the score at time 1 was strongly correlated to the scores at time 2 for all factors indicated in the ASQ (Adolescents Stress Questionnaire).

Further analysis showed that factors encompassing (1) too much homework, (2) concern about the future, (3) difficulty of some subjects, (4) having to study things they are not interested in, (5) not enough time to have fun, (6) putting pressure to meet the goals, (7) having to study things they do not understand, (8) not enough time for leisure activities, (9) having to make decisions about future work or education, and (10) parents expecting too much from them had the highest mean comparatively.

In addition, factors including (1) getting along with the boyfriend/girlfriend, (2) making the relationship work with boyfriend/girlfriend, (3) not enough time for the boyfriend/girlfriend, (4) breaking up with the boyfriend/girlfriend, (5) getting along with the teachers, (6) work interfering with school and social activities, (7) pressure to fit in with peers, (8) pressure to work to make money, (9) disagreements with father, and (10) disagreements with teacher had the lowest mean comparatively. A comparison of the highest and lowest stressful life is presented in Figure 4.7.

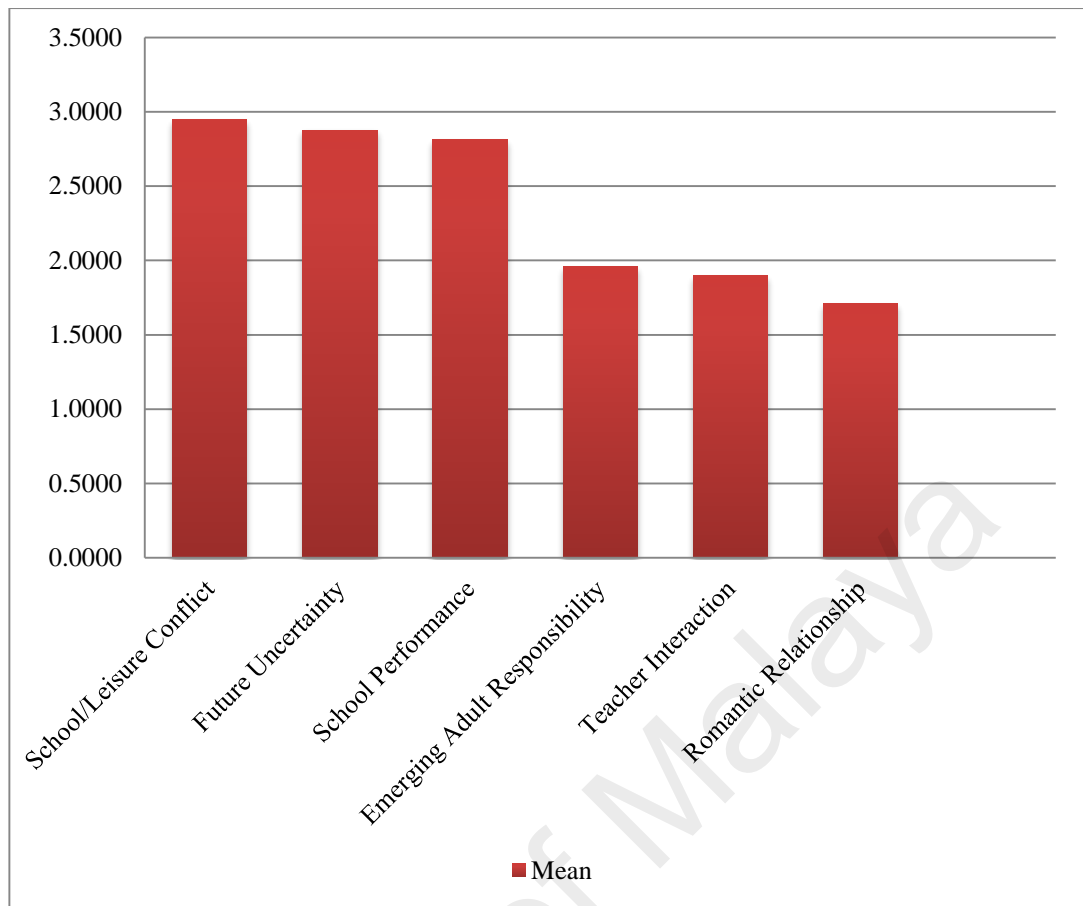


Figure 4.7: Adolescents' stressful life events

4.3.2 Stress-level and other factors

4.3.2.1 Age and Gender

In this study, there was no significant gender difference in self-reported adolescent stress ($F(714, 633.8) = .181, p = 0.50$) as determined by T-test.

There was however, a statistically significant difference among adolescents with different ages in self-reporting stress-level ($F(2, 841) = 4.325, p = 0.00$) as determined by one-way ANOVA. A Tukey's post-hoc revealed that respondents who were 15 year-olds reported more stressful life events ($M = 133.08 \pm 37.07$ score, $p = 0.00$) as compared to 13 year-olds ($M = 124.94 \pm 29.24$ score, $p = 0.01$).

4.3.2.2 Socioeconomic status

As parents had reported their income, education, and employment status in the survey, these items were also assessed with regards to investigating adolescents' stress-level. In looking at parental incomes, there was a statistically significant difference among adolescents with different family incomes in reporting stress-level ($F(3, 840) = 73.295$, $p = 0.00$) as determined by one-way ANOVA. A Tukey's post-hoc revealed that respondents who belonged to the low income groups reported more stressful life events ($M = 143.26 \pm 35.18$ score, $p = 0.00$) as compared to those who belonged to medium income groups ($M = 131.47 \pm 29.14$ score, $p = 0.00$) and high income groups ($M = 101.78 \pm 23.55$ score, $p = 0.00$).

In looking at maternal education, there was a statistically significant difference among adolescents with different maternal education backgrounds ($F(4, 839) = 14.687$, $p = 0.00$) as determined by one-way ANOVA. A Tukey's post-hoc revealed that respondents whose mothers had education at the primary school level reported more stressful life events ($M = 133.59 \pm 32.98$ score, $p = 0.00$) as compared to those whose mothers had tertiary level education ($M = 109.71 \pm 31.85$ score, $p = 0.00$).

Regarding paternal education, there was a statistically significant difference among adolescents with different paternal education backgrounds ($F(4, 839) = 26.389$, $p = 0.00$) as determined by one-way ANOVA. A Tukey's post-hoc revealed that respondents whose fathers had education at the primary school level reported more stressful life events ($M = 136.82 \pm 33.25$ score, $p = 0.00$) as compared to those whose fathers had tertiary level education ($M = 109.45 \pm 31.10$ score, $p = 0.00$).

Regarding parental employment status, there was a statistically significant difference among adolescents with different parental employment status in their self-reporting stress-level ($F(3, 840) = 59.795$, $p = 0.00$) as determined by one-way ANOVA. A

Tukey's post-hoc revealed that respondents whose parents were employed full time reported less stressful life events ($M = 115.34 \pm 27.76$ score, $p = 0.00$) as compared to those whose parents were unemployed ($M = 140.18 \pm 38.23$ score, $p = 0.00$).

4.3.2.3 Neighbourhood satisfaction

The adolescents/students were asked whether or they were satisfied with the neighbourhood environment they were in. Interestingly, there was a statistically significant difference between adolescents' satisfaction level in their self-reported stressful life events ($F(2,841) = 5.248$, $p = 0.00$) as determined by one-way ANOVA. A Tukey post-hoc test revealed that adolescents who were not satisfied with their neighbourhood environment reported more stressful events ($M = 130.19 \pm 33.02$ score, $p = 0.00$) than who were satisfied ($M = 126.06 \pm 33.53$).

4.3.2.4 Preference of outdoor environment

There was a statistically significant difference among adolescents who had different behaviours of outdoor activities as determined by one-way ANOVA ($F(3,840) = 36.74$, $p = 0.01$). A Tukey post-hoc test revealed that stress-level was statistically significantly lower for those who only sometimes preferred outdoor activities ($M = 126.59 \pm 32.20$ score) as compared to those who always preferred the outdoor activities ($M = 138.92 \pm 38.86$ score, $p = 0.00$).

4.3.2.5 Family functioning

There was a statistically significant difference among adolescents with different family functioning as determined by one-way ANOVA ($F(3,840) = 25.456$, $p = 0.00$). A Tukey post-hoc test revealed that stress-level was statistically significantly higher for those whose parents had not functioned well at all ($M = 169.29 \pm 20.39$ score) as compared to those whose parents functioned very well ($M = 122.19 \pm 29.79$ score, $p = 0.00$),

functioned somewhat well ($M = 124.59 \pm 30.96$ score, $p = 0.00$), or not very well ($M = 140.72 \pm 38.61$ score, $p = 0.00$).

4.3.2.6 General health status

In this regard of general health, there was a statistically significant difference among adolescents as determined by one-way ANOVA ($F(5,838) = 42.30$, $p = 0.00$). A Tukey post-hoc test revealed that stress-level was statistically significantly higher for those with poor health conditions ($M = 184.66 \pm 51.67$ score) as compared to those with excellent health conditions ($M = 106.98 \pm 31.68$ score, $p = 0.00$), very good health conditions ($M = 121.33 \pm 27.78$ score, $p = 0.00$), or good health conditions ($M = 135.61 \pm 28.30$ score, $p = 0.00$). Table 4.13 demonstrates the main findings of this section.

Table 4.13: Summary of significant difference regarding the stress-level

	Self-reported stressful life events
Age	√
Gender	-
Parental Income	√
Parental Employment	√
Maternal education	√
Paternal education	√
Outdoor preference	√
Neighbourhood satisfaction	√
Transportation mode	√
Family functioning	√
Health status	√

4.4 Findings of the association between neighbourhood disorders and stress

A Pearson correlation was run to determine the relationship between neighbourhood disorder and stress-level. There was a moderate positive correlation between perceived neighbourhood disorder and measured stress-level which was statistically significant ($r = 0.56, n = 844, p < 0.01$).

Furthermore, correlation has been considered for each item of disorder (Table 4.14) and the results show that three items which were most related to stress-level were social disorders including peer group characterized as a gang ($r = 0.34, n = 844, p < 0.01$), people drinking alcohol openly on the street ($r = 0.30, n = 844, p < 0.01$), and drunken or intoxicated people ($r = 0.30, n = 844, p < 0.01$). In addition, there were three least relevant factors which include physical disorders including cigarette or cigar butts or cigarette packages on the sidewalk or in gutters ($r = 0.14, n = 844, p < 0.01$), graffiti, graffiti on buildings ($r = 0.17, n = 844, p < 0.01$), signs or walls, and evidence of graffiti that has been painted over ($r = 0.19, n = 844, p < 0.01$). These results would be exclusively discussed in the next chapter.

Table 4.14: Pearson's r of the association between neighbourhood factors and stress

	Stress	Experience physical	Experience social	Perception of physical	Perception of social
Stress	1	.310*	.474*	.342*	.336*
Experience physical		1	.551*	.334*	.274*
Experience social			1	.307*	.315*
Perceptions physical				1	.631*
Perceptions social					1

* Correlation r is significant with p values of less than 0.01 (2-tailed).

4.4.1 Multivariate Analysis

The results of multivariate linear regression show that the effects of neighbourhood disorder would be increased by other factors such as socioeconomic status, demographic characteristics, and individual characteristics. Table 4.15 illustrates five models among which model no. 5 has been selected as the final pathway. This pathway includes looking at variables of neighbourhood disorders, socioeconomic status, demographic characteristics, and individual characteristics.

The results of multivariate analysis show that the association between neighbourhood social and physical disorders and adolescents' stress remained significant with the presence of other factors such as age, gender, socioeconomic status, family functioning, and individual preferences. However, among all these factors, age and gender were identified as moderators and they would not be changed in a person. Socioeconomic status, parental functioning, and individual characteristics had the mediating role in the association between neighbourhood disorders and stress.

Table 4.15: Models of the association between neighbourhood disorders and stress

Models	ANOVA ^a				
	<i>r</i>	<i>r</i> ²	<i>SD.</i>	<i>F</i>	<i>p</i>
1	.467	.218	32.7	204.0 (1, 732)	.00 ^b
2	.480	.230	32.4	109.2 (2,731)	.00 ^c
3	.656	.430	29.3	3.01 (6, 24)	.02 ^d
4	.752	.565	26.7	2.88 (9, 20)	.02 ^e
5	.771	.594	27.2	2.39 (11, 18)	.04 ^f

a. Dependent Variable: Stress

b. Predictors: (Constant), Neighbourhood Disorder

c. Predictors: (Constant), Neighbourhood Disorder, Family Functioning

d. Predictors: (Constant), Neighbourhood Disorder, Family Functioning, SES

e. Predictors: (Constant), Neighbourhood Disorder, Family Functioning, SES, age, gender

f. Predictors: (Constant), Neighbourhood Disorder, Family Functioning, SES, age, gender, Individual Characteristics (indoor/outdoor preferences, neighbourhood satisfaction)

4.5 Spatial analysis results

In the first part of presenting the results using Moran's *I* method, both stress-level and experiences and perceptions of neighbourhood social and physical disorder are presented. The second part deals with the distributions of stress-levels and neighbourhood disorders which are illustrated via maps.

4.5.1 Moran's I

The results of spatial autocorrelation analysis show that there were no statistically significant distribution of stress, experiences, and perceptions of neighbourhood social and physical disorders. However, the reason causing this could be attributed to the limited number of neighbourhoods. Since not all the 844 participants provided their locations, therefore, only 62 neighbourhoods out of 283 were available for analysis.

4.5.2 LISA

Despite the fact that there were no significant clustering of stress or neighbourhood disorders, LISA would still be able to identify the neighbourhoods as those which have the same or adverse score of stress or neighbourhood disorders (Figure 4.8). The output of the LISA method helped to highlight the distinction between a statistically significant (0.05 level) cluster of high values (HH), cluster of low values (LL), outlier in which a high value is surrounded primarily by low values (HL), and outlier in which a low value is surrounded primarily by high values (LH). These results are illustrated separately in the following maps to show stress-level, experiences, and perceptions of neighbourhood social and physical disorders. The yellow colour in the map showed the areas that were not significant in their neighbouring while the red colour showed neighbourhoods with high level scores that were surrounded by other neighbourhoods with high level scores. The outlier is shown by the blue colour in the map.

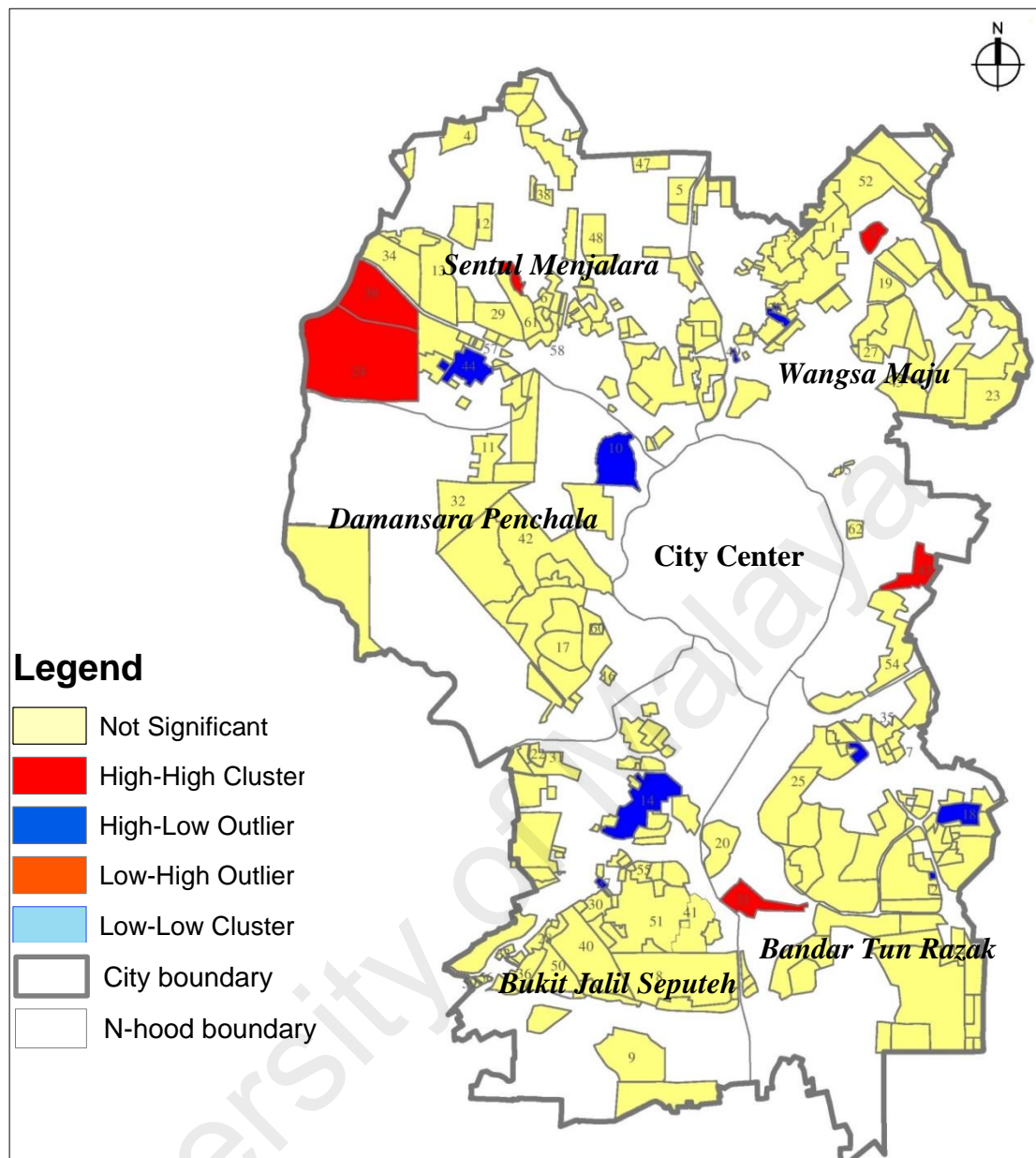


Figure 4.8: Spatial analysis of stress-level

There was no low to high and low to low neighbouring for this study. Therefore, there were two categories that require to be considered including high-high clusters, and high-low clusters. In the map, *Bandar Manjalara* and *Taman Bukit Maluri*, *Desa Pandan* were shown as the hotspots of the city in all stress-level, experiences and perceptions of neighbourhood disorders. *Taman Bukit Tunku*, *Taman Cheras*, *Taman Desa* were illustrated as outliers in both stress, and neighbourhood social and physical disorders. The results contained in this section are for the purpose of interpreting data which are related to the hot spots located in the city.

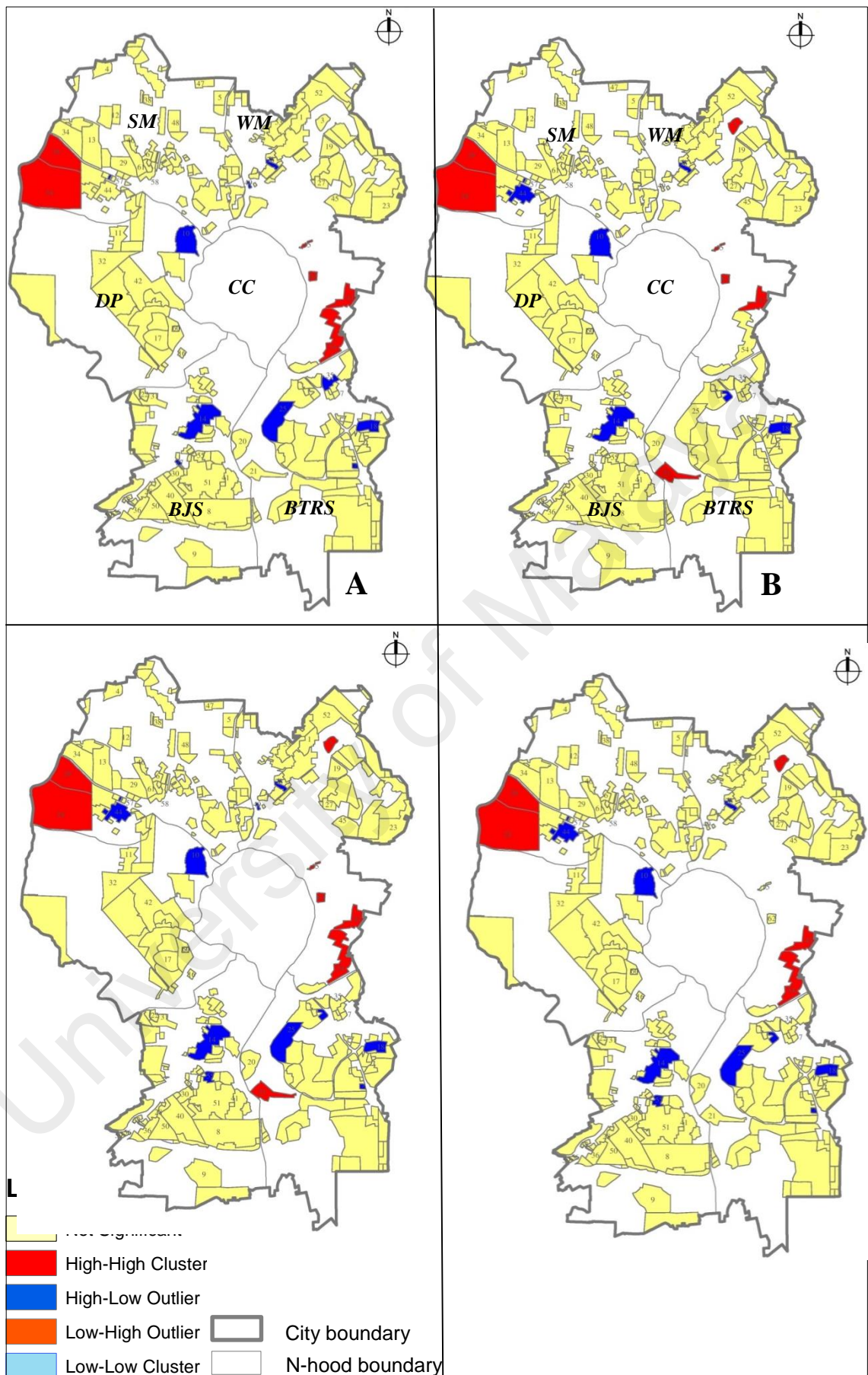


Figure 4.9: Spatial analysis of neighbourhood disorders.

A: Experience of physical disorder, B: experiences of neighbourhood social disorders, C: perceptions of neighbourhood physical disorders, and D: perceptions of neighbourhood social disorders

4.5.3 Stress distributions

For further analysis, the mean of stress-level reported by the students were calculated for each neighbourhood. This could allow an insight into seeing which parts of the city has the lowest and highest stress-level as reported by the respondents/students. Figure 4.10 illustrates how stress-level can vary across neighbourhoods in Kuala Lumpur. The darker colours showed the higher level of adolescents' stress-level. Within the map, stress-level was divided into five categories.

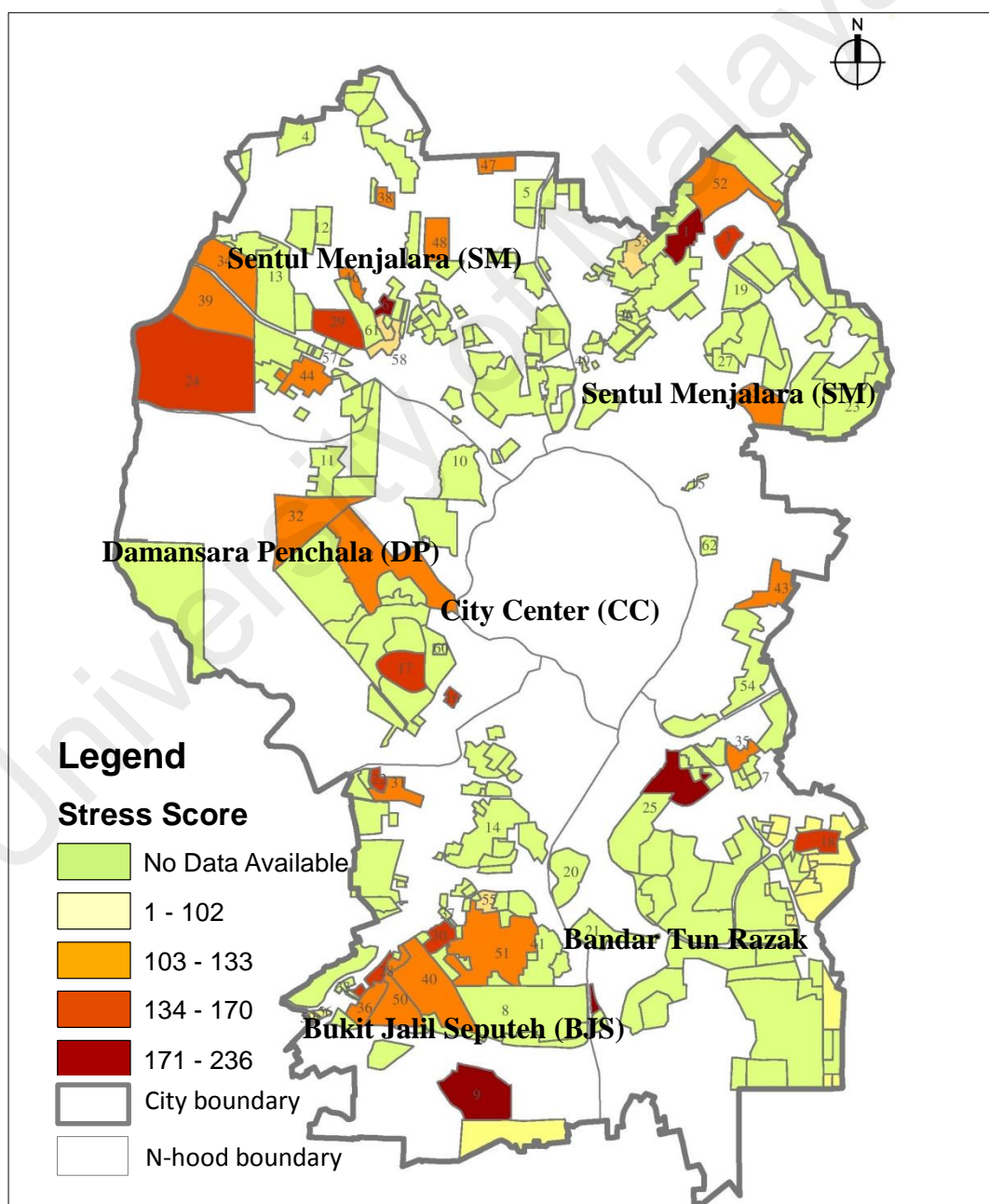


Figure 4.10: Stress-level distribution across urban neighbourhood

Nonetheless, it is apt to mention that these results were taken from those 62 neighbourhoods which provided available data indicating stress-level. Data for all the 283 neighbourhoods, as mentioned above, were not available. Therefore, generalization was not possible. This issue will be discussed in the next chapter. According to the map, it appears that *Taman Setapak Indah* ($M = 236$), *Taman Hijau* ($M = 236$) and *Taman Bunga Raya* ($M = 236$) had the highest level of reported stress by the residents. In contrast, *Taman U-Thant* (freeman) ($M=236$), *Taman Koh Doh* ($M = 236$), *Taman Bangsar* ($M = 236$), *Taman Maluri* ($M = 236$), *Taman Melati* ($M = 236$), and *Taman Medan Idman* ($M = 236$) had the lowest level of reported stress.

4.5.4 Distinguishing the hot spots where reported stress and neighbourhood disorders are high

Table 4.16 illustrates neighbourhoods that were both high in the reported stress and neighbourhood disorders. The table showcases the priorities of neighbourhoods according to the three levels of low, medium, and high. The second column illustrated in the table indicates the stress multiplied by neighbourhood disorder based on a score of 1-5. A high score indicates a higher priority of neighbourhood for service matters.

Table 4.16: Neighbourhood ranking

No.	Name	Stress × Neighbourhood Disorder	Risk
1	<i>Taman Angkasa</i>	0.72	Low
2	<i>Taman U-Thant (Freeman)</i>	0.72	Low
3	<i>Taman Melati</i>	0.84	Low
4	<i>Taman Puchong Indah</i>	0.85	Low
5	<i>Taman Kok Doh</i>	0.94	Low
6	<i>Taman Tan Yew Lai</i>	0.95	Low
7	<i>Taman Gembira</i>	1.05	Low
8	<i>Taman Sejahtera</i>	1.05	Low
9	<i>Taman Puah Jaya</i>	1.07	Low
10	<i>Taman Bangsar</i>	1.07	Low
11	<i>Taman Jinjang Baru</i>	1.14	Low
12	<i>Taman Medan Idaman</i>	1.18	Low

13	<i>Taman Batu Muda</i>	1.18	Low
14	<i>Taman Yarl</i>	1.22	Low
15	<i>Taman Overseas Union</i>	1.25	Low
16	<i>Taman Mastiara</i>	1.26	Low
17	<i>Taman Sri Hartamas</i>	1.33	Low
18	<i>Bukit Damansara</i>	1.35	Low
19	<i>Taman Bukit Angkasa</i>	1.39	Low
20	<i>Taman Seri Segambut</i>	1.39	Low
21	<i>Taman Beringin</i>	1.39	Low
22	<i>Taman Kuchai Jaya</i>	1.40	Low
23	<i>Desa Pandan</i>	1.40	Low
24	<i>Taman Skyline</i>	1.40	Low
25	<i>Taman Desa Wira</i>	1.42	Medium
26	<i>Taman Koperasi Polis II</i>	1.45	Low
27	<i>Taman Salak Selatan</i>	1.45	Low
28	<i>Taman Maluri</i>	1.47	Low
29	<i>Taman Kobena Cheras</i>	1.47	Low
30	<i>Taman Kepong</i>	1.50	Low
31	<i>Bandar Manjalara</i>	1.53	Low
32	<i>Bandar Baru Ampang</i>	1.53	Low
33	<i>Taman Desa Petaling</i>	1.54	Low
34	<i>Taman United (Lee Yan Lian)</i>	1.54	Medium
35	<i>Taman Bukit Maluri</i>	1.56	Low
36	<i>Taman Desa</i>	1.56	Low
37	<i>Taman Kuchai</i>	1.60	Medium
38	<i>Taman Kinrara</i>	1.66	Medium
39	<i>Bangsar Baru</i>	1.69	Low
40	<i>Taman Sri Sinar</i>	1.73	Medium
41	<i>Mon't Kiara</i>	1.76	Low
42	<i>Taman Sg. Besi</i>	1.79	Medium
43	<i>Kepong Baru</i>	1.90	Medium
44	<i>Bandar Baru Sri Petaling</i>	1.94	Medium
45	<i>Keramat Jaya</i>	1.95	Medium
46	<i>Taman Cheras</i>	1.98	Medium
47	<i>Wangsa Maju R1</i>	2.00	Medium
48	<i>Taman Batu</i>	2.00	Medium
49	<i>Taman Bunga Raya</i>	2.01	Medium
50	<i>Taman Setapak Indah Jaya</i>	2.04	Medium
51	<i>Taman Fadason</i>	2.05	Medium
52	<i>Bandar Baru Bukit Jalil</i>	2.06	Medium
53	<i>Bukit Kerinchi</i>	2.12	Medium
54	<i>Bangsar Utama</i>	2.12	Medium
55	<i>Taman Intan Baiduri</i>	2.15	Low
56	<i>Taman Setapak Jaya</i>	2.18	High
57	<i>Taman Tenaga Ehsan</i>	2.53	High
58	<i>Bandar Sri Permaisuri</i>	2.60	High
59	<i>Taman Hijau</i>	2.69	High
60	<i>Taman Bukit Tunku</i>	3.24	High

61	<i>Taman Setapak Indah</i>	4.66	High
62	<i>Taman Tun Hussein Onn</i>	2.04	Medium

SUMMARY

In this chapter the main findings and related discussions were explained in four sections. The first research question focuses on whether adolescents perceive neighbourhood disorders in their neighbourhoods. Findings showed that adolescents can perceive the neighbourhood disorders in two different ways including social and physical disorders. Further, the results also indicate that adolescents' experiences of neighbourhood disorders differ from their perceptions. Adolescents seemed to perceive the social disorders more.

The second research question focuses on the stress-level of adolescents. Accordingly, the second objective was aimed at measuring the stress-level of adolescents. The main findings showed that nearly half of the respondents/students in this study had reported moderately on stressful life events. Among all the stressors indicated in the survey, academic stress and future uncertainty were the highest source of stress for the adolescents while romantic relationship was the lowest source of stress. The chapter also highlighted that other factors such as age, socioeconomic status, family functioning, and individual preferences also affected the stress-level of adolescents.

Finally, the third and last research question focussed on looking if there was any association between neighbourhood disorders and stress among the adolescents. Results indicate that there was a positive moderate association between neighbourhood disorders and adolescents. This association increased to strong level when adding other mediators such as age, gender, family functioning, parental socioeconomic status, and individual preferences. A comparison of this with other settings, possible pathways and the reasons, were also discussed.

CHAPTER 5: DISCUSSION

The discussion chapter is organized based on the research questions and findings achieved from the current research. The chapter is divided into three main sections with section one arguing about the findings which were related to the first objective of the research looking at the experiences and perceptions of neighbourhood disorders. Here the first research question attempts to look for answers as to whether neighbourhood disorders can be experienced and perceived by adolescents or not.

The second section of this chapter part discussed the results of the adolescents' stress-level assessment. This section answers the second research question which is on the stress-level reported by the adolescents. In addition, the factors encompassing academic life, family, and individual character that seemed most plausible in contributing to the adolescents' stress-level were also debated.

The third research question looks as whether there was any association between neighbourhood social and physical disorders and adolescents' stress-level. Accordingly, the last part of this section discussed the association between neighbourhood social and physical disorders and stress as seen through spatial analysis of this association. In this section, mediating and moderating factors such as age, gender, socioeconomic status (parental income, education, and employment status) family functioning, and individual preferences (indoor/outdoor preferences, neighbourhood satisfaction) were debated. For each of these factors, plausible pathways through which they might affect the association were argued. The following diagram demonstrates the flow of the discussion chapter and how the research questions are being addressed.

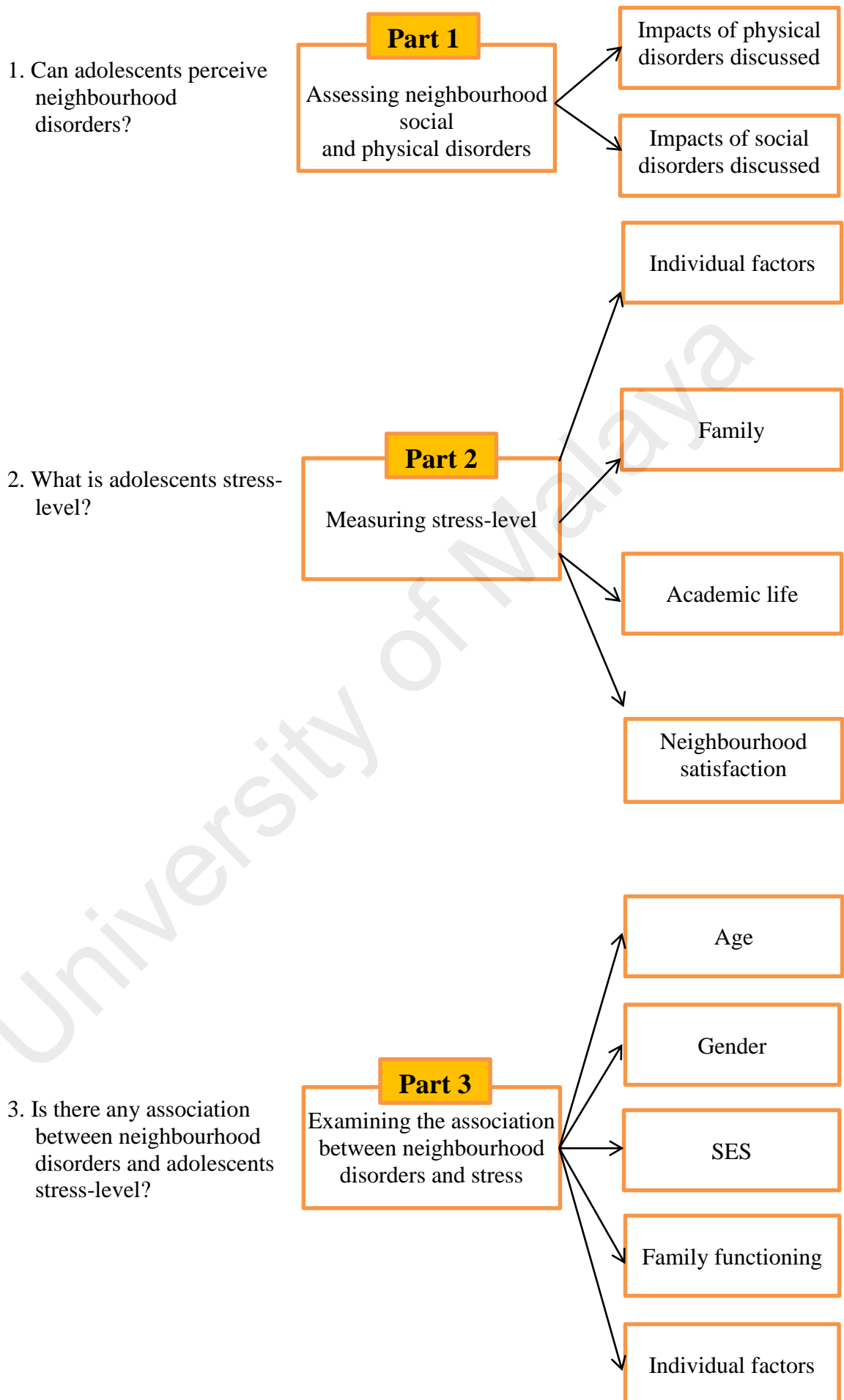


Figure 5.1: Flow of discussion chapter

From the findings achieved from the current research, it can be said that the current research advances the knowledge of living places and their roles in the mental health of adolescents. This is accomplished in the following manner. First, this research confirms that neighbourhood disorders are experienced and perceived by adolescents. Second, this research acknowledges that neighbourhood disorders could be experienced and perceived by adolescents in two different ways: socially and physically. Findings of the research have indicated that adolescents experienced more physical disorders than social disorders. The results also suggest that adolescents perceived more social disorders than physical ones. Third, the research indicates that the association between neighbourhood disorders and stress was significant. Further, this association remained significant in the presence of factors such as age, gender, socioeconomic status, family functioning, and individual preferences. The results from the analyses, in addition, were largely consistent with scientific studies addressing neighbourhood and other contextual findings on adolescents' mental health including their broader health behaviours (Snedker, Herting & Walton, 2013).

5.1 Living in a disordered neighbourhood

5.1.1 Experiences and perceptions of neighbourhood disorders

The first research question asked whether or not adolescents can perceive the neighbourhood disorders and accordingly, the first objective was to assess the experiences and perceptions of neighbourhood disorders among the adolescents. As mentioned the neighbourhood disorders were in two ways. The experiences were referred to the frequency of disorders as seen by the adolescents while the perceptions were referred to the adolescents' imaginations about the neighbourhood disorders.

It cannot be denied that the difference between experience and perception is one of the important issues that should be reflected in the current research. While most studies highlighted experiences or perceptions (Meltzer, Vostanis, Goodman & Ford, 2007) it cannot be denied that the difference between these two factors can be equally important as a finding. For example, the reason why there is a sense of fear existing in their neighbourhood among the adolescents should be considered. Also, the strategies that moderated this perception towards developing a better idea about one's residential neighbourhood is significant. This it is argued, can consequently, create positive feelings and a better sense of living in the environment where the adolescents are embedded within.

5.1.2 The impact of neighbourhood physical disorders

According to the findings of the current research which focussed on fulfilling the first objective, it was noted that adolescents reported being more frequently exposed to the physical disorders. Reports also showed that among all of the variables, garbage had the highest mean while abandoned cars had the lowest mean among all the physical disorders. Today, a big number of studies had demonstrated that neighbourhood physical setting has a pivotal role in changing adolescents' health and behaviours (Karb, 2010).

Previous study from Clark & Uzzell (2002) showed that neighbourhoods provide significantly more places for actions and interactions than schools and even town centres. It has been shown that town centres was used less often than neighbourhoods and school. The consequence of exposure to such cases can have different effects ranging from provoking dirty and low-quality neighbourhoods to exposure of neighbourhoods to different environmental toxins.

The second aspect of exposing adolescents to different physical disorders can also enhance the possibility of infectious diseases being circulated although this is not the scope of the current research. Nonetheless, other possible pathways through which neighbourhood physical disorders can affect adolescents' health or behaviours may emerge.

First, neighbourhood with higher levels of disorders can indirectly affect the health of the adolescents. It may begin with the phenomenon where areas which are physically disordered seem to be capable of altering the social settings (e.g., people's behaviours in the neighbourhood) of that neighbourhood. For instance, the lack of surveillance on garbage collection or cleanliness is a sign indicating that the said neighbourhood is of low quality. The presence of these disorders only serve to make matters worse for the residents who comprise those people with low socioeconomic status as their health becomes affected. Thus, it is not untrue to say that while the physically disordered neighbourhoods remain the settlement of the poor, those with higher socioeconomic status would choose to flee from settling down in these neighbourhoods that are of low quality.

Studies have also shown that families who live in less developed neighbourhoods are also most likely to be unemployed (Sundquist, Theobald, Yang, Li, Johansson & Sundquist, 2006; Kohen et al., 2008). This is because they might not be able to afford the cost of the housing as the neighbourhood where they now settle in is more costly as compared to their previous neighbourhoods which have become less accessible due to population and migration. Gradually, a neighbourhood that is filled with people from low socioeconomic status deteriorates in terms of social aspects too. The higher rate of unemployment experienced by the residents increases the possibility of the unemployed loitering around. The issue becomes worse because such kinds of neighbourhood also lacks surveillance which ultimately leads to crime. It cannot be denied that even the neighbours living in the

same neighbourhoods are less cooperative in building the neighbourhood to become better quality. Consequently, as a result of the lack control and participation over neighbourhood disorders, the same neighbourhood becomes worse and becomes converted to slums. Living in such kinds of neighbourhoods only worsens the environment when loitering becomes a common sight. Therefore, physical disorders can inevitably speed up the place to become even more socially disordered. As part of those living in such neighbourhoods, adolescents who are exposed to such a scenario in their everyday life thus becomes more at risk of mental health outcomes like stress. Their behaviours also become affected and they began to notice and possibly pick up bad habits like smoking and so on. Nonetheless, this phenomenon also depends on other factors such as family functioning or their personal attitudes as well.

In the same line of discussion, it needs to be added that neighbourhoods with high levels of physical disorders may discourage various forms of outdoor activities which indirectly, are needed, so as to maintain health (Saimon et al., 2013). Outdoor activities such as walking, jogging, or bicycling within low quality and physically disordered neighbourhoods thus may become undesirable for the residents including adolescents.

In contrast, living in tidy and clean neighbourhoods encourages more outdoor activities which, when practised can assist in preventing many mental and physical diseases such as depression, distress, and cardiovascular diseases. In the Malaysia context, the fear of getting involved in outdoor activities as reported by adolescents was noted in a study done by Saimon and her colleagues in 2013. They discussed that social problems including fighting can prevent adolescents from playing in their neighbourhoods. In comparison, people prefer to live in high quality neighbourhoods but how is this achieved? There are guidelines that encourage building green neighbourhoods for liveable cities. The main characteristics of this type of neighbourhoods are that they are high in quality comprising

lots of green spaces for different activities. In November 2012, in the World Town Planning Day celebration, the Ministry of Housing and Local Government (MHLG) gave recognition to the best performing local authorities that had been successful in implementing green neighbourhoods. They further provided the five green neighbourhood initiatives which comprise the following characteristics (Rosly et al., 2012):

- a) The provision of pedestrian walkways;
- b) The provision of bicycle lanes;
- c) The implementing of the rainwater harvesting system;
- d) The practice of waste composting; and
- e) The development of neighbourhood gardens/farms.

All of the above are features of neighbourhood order which was also mentioned in studies (Skogan, 1990). It was explained that neighbourhood orders contain characteristics which are the opposite of neighbourhood disorders. In the Malaysia context, guidelines of green neighbourhoods are linked to neighbourhood orders. The 10th Malaysia Plan (2010-2015), had, in addition to reinforcing and placing further emphasis on the use of renewable energy and on increasing energy efficiency had further highlighted other approaches in building vibrant and liveable cities. These approaches include planning at neighbourhood level where mixed uses of land are predominant in encouraging living, working and leisure activities all done within the same compact area and the focus goes to a public transport that is supported by a pedestrian-friendly street network (Rosly et al., 2012). As Rosly et al. (2012, p.5) defines, green neighbourhood is an ordered neighbourhood that is:

“planned and designed in an integrated manner with the priority given to practice green lifestyle, protection and consumption of natural resources; application of green technology; and recycling that seek to preserve the environment, reduce the ecological footprint, reduce the production of carbon emission, improving of public health, safety as well as the general welfare of the community.”

Some of the key components for designing green neighbourhoods include what are described as can remarkably enhance the order level in neighbourhoods and raise the quality of mental health as a result. These key components encompass:

- i. Green building (of which the building structure, material used and the design should as much as possible, take advantage of natural elements, the indoor and outdoor quality of the building). By optimising passive and active design strategies, green buildings can reduce heat gain.
- ii. **The** guideline encourages designs that promote walking and bicycling lifestyles that are well connected to rapid, convenient and efficient transit services. Encouraging residents to walk and to bicycle helps to reduce carbon emission from motorised vehicles.
- iii. Green land use planning where the neighbourhood design should be supported by mixed land use (medium to high density), contain a variety of housing types and is compact in development. It should also support an efficient public transportation system, reduce the need of residents to travel by motorised vehicles and allow more spaces for green areas and all of these shall reduce carbon emission.

According to the findings of the current research, adolescents who commute to and from schools with parents' vehicles had perceived lower levels of neighbourhood disorders. From this, it can be deduced that walking or bicycling may increase adolescents' chances of experiencing the disorders in the neighbourhood. Therefore, the implementation of these key components without integrity would not effectively change the circumstances at all. For example, increasing the culture of walking and bicycling among residents require secure places, otherwise, no one would intend to walk in an unsafe neighbourhood. Due to the lack of data, it is difficult to discuss the progress of such a scheme, and whether or not such an approach can effectively change the social and physical settings of current neighbourhoods.

Changing the social and physical setting of neighbourhoods may possibly not enhance the quality of life either unless residents work together. As the findings of the current research indicates, bicycling was associated with lower level stress. Adolescents who used bicycle when commuting to and from schools had lower stress as compared to those who were usually dropped off by parents' vehicles. This evidence suggests that bicycling, as is shown in other study, can increase the health status of adolescents (Lubans, Boreham, Kelly & Foster, 2011). In addition, for bicycling to become a common practice, road safety and neighbourhood safety must be ensured. Parents with school going children need to be sure that their child is safe when alone. If this safety can be implemented, the neighbourhood becomes better in quality and more bicycling can occur otherwise, their children would be restricted from bicycling to school.

In this regard, an ordered neighbourhood can encourage adolescents to either cycle or walk. This implementation can remarkably help to decrease diseases such as stress, depression, or even cardiovascular disease. Also, studies have shown that early physical activities like bicycling or walking can help to prevent future health problems as well

(Frank & Engelke, 2001; Pucher & Dijkstra, 2003; Timperio, Crawford, Telford & Salmon, 2004). Several studies have also encouraged the idea of bicycling and walking as ways of decreasing diseases such as obesity. Nonetheless, all of these benefits would not be possible unless the neighbourhoods become socially and physically ordered and sustainable.

Therefore, it can be said that the physical setting of a neighbourhood can affect the health of residents indirectly. The impacts caused by other factors are discussed in next sections.

5.1.3 The impact of neighbourhood social disorders

With regards to social disorders, the results obtained from the first objective showed that despite less experience of social disorders, fear was still there. Findings also showed that among all of variables, the factor of fighting and adults loitering around had the highest mean. In contrast, the adolescents' report indicates that illegal selling had the lowest mean. Thus, it is deduced that adolescents can develop a negative feeling about the place which they use every day as they commute to and fro from school and this can affect their mental health. The consequence and effects of negative feelings have been discussed in previous study (Saimon et al. (2013).

Therefore, it can be said, that perceptions of social disorders can affect adolescents' health in many aspects including a decrease in outdoor activities, provoking the sense of fear, developing a general negative attitude, feeling unsafe, and increasing the screen-time of computers. The study by Saimon et al. (2013) has shown that this perception had resulted in an increase of screen-time in adolescence, because they had less activities outside. Hence, perceptions of social disorders can be considered as one of the key indicators of a community with young healthy people, thus an important indicator.

As the findings of this study have demonstrated, the mean of the experiences of physical disorders is higher than the mean of the experiences of social disorders. This demonstrates that adolescents were exposed more to physical disorders of the neighbourhood than others. Nonetheless, even though they were more exposed to physical disorders, they had more fear of social disorders than physical disorders. This means that they may be witnessing more physical disorders than others but yet they tend to perceive social disorders as being more stressful. This can be seen in the instance where a student who commutes to and fro from school may be witnessing more garbage, empty bottles, and cigarette butts on the sidewalk. However, once they imagine about social problems such as fighting, gang groups, or adults loitering on the street, their imagination can provoke a sense of fear. This phenomenon shows the importance of social context in adolescents' mental health. It is true that physical disorders such as garbage can be seen more frequently but social problems such as fighting may have more impact on mental health.

The lack of maintaining some control over the neighbourhood can also put the neighbourhood to more risk factors. This is exemplified by the fact that problems to do with garbage, litter, cigarette butts on the side walk, people fighting or loitering are beyond the control of the residents who are also unable to move to other places because they lack the financial resource. In contrast, when the families concerned lack the economic resources, their situations become one of isolation such that they worsen the disorders. For example, residents may restrict their children from outdoor activities or they may impress the sense of fear in their children concerning the harmful effects of staying outside.

Such a strategy could affect the mental health of the youths as this kind of social isolation can lead the youths including adolescents to experience negative mental health outcomes such as stress, depression or anxiety. It is noted that even with social support the

deleterious effects of social disorders on the neighbourhoods cannot be changed because of the broad impact the social disorders create. When there is little interaction among neighbours and adolescents, the environment becomes one of unfriendliness. It is true that social support can reduce the hazardous effects of neighbourhood disorders but the size of the network can be just as important. Thus, it would seem that neighbourhoods with such high volume of disorders would require more than social support to enable them to lessen the risks mentioned earlier.

5.1.4 The roles other factors play in experiences and perceptions of neighbourhood disorders

In this section, the role other factors such as demographic characteristics, socioeconomic status including parental income, education, and employment status, and family functioning, as well as individual character play in neighbourhood disorders are discussed.

5.1.4.1 Role of age and gender on experiences and perceptions of neighbourhood disorders

As the results of this research have shown, there is no gender difference but there is age difference in adolescents' experiences and perceptions of neighbourhood disorders. The gender difference regarding neighbourhood disorders might be more visible during the late adolescence, as then; they might have developed different feeling about their surroundings. In addition, cultural setting may also play a role in the experiences and perceptions of neighbourhood disorders. For example, in this research and setting girls and boys have the same attitude towards factors such as fighting, loitering, and cigarette butts on the sidewalk. However, there seemed to be some impact based on the age factor. As has been explained, participants of this research were adolescents aged between 13-15 year-olds. Results showed that there is difference between the perceptions of

neighbourhood for older participants who reported more neighbourhood disorders. The role of age also affected their perceptions of hazardous events as those in their late adolescence reported an increase in the amount of neighbourhood perception along with other problems. If this is the case among adolescents, it is proposed that preventions of awareness of neighbourhood disorders should be implemented from an early age since the older they become, the more these adolescents may experience or perceive about their neighbourhood disorders.

5.1.4.2 Effects of socioeconomic status on experiences and perceptions of neighbourhood disorders

Adolescents from lower socioeconomic status which comprise parental income, education, and employment status were more likely to interpret the neighbourhood disorders in a negative manner. This may be attributed to the deterioration of parental functioning which they experienced in their families, their coping strategies, and their being denied access to the facilities provided by the neighbourhood.

Their low socioeconomic status tends to put a strain on them in various manners. For example, their parents may be involved with long working hours and their type of jobs may also make it difficult for these parents to manage the adolescents both mentally and physically. The other problem is that despite long working hours, the salary is low and insufficient to afford all the expenses their lives incurred. Due to these reasons, parents may be spending more time juggling with their jobs and financial strains rather than spending time with their children. Consequently, the children brought up in such families become left alone at home and without guidance, they become less able in acquiring the right strategies to cope with negative life events. Once they are faced with the negative life events including their neighbourhoods' problems, they are more likely to interpret

these events negatively. Therefore, it is plausible that they would perceive more neighbourhood disorders than others.

In contrast, families with higher levels of education usually have parents with full time jobs and satisfying salaries. These parents, being more educated, seem more likely to better manage their time and as beings with better knowledge, they are also more likely to spend more time with their children. Parents of such educational background usually do not leave their adolescents to spend time alone. Due to the parents' better education and possibly better financial situations, adolescents belonging to such families would be given more guidance which would also enable them to acquire better coping strategies with life's events. Guidance by such parents can result in their ability to increase their coping strategies thereby lessening the undesirable strains faced by adolescents of less educated parents. When there are any negative life events, these adolescents are better able to cope even if these occur in their living places and neighbourhoods. Indeed, one pathway can be explained through the resilience and coping strategies. Thus, it can be deduced that adolescents with higher level of parental income and less parental job difficulties were less likely to report on negative events.

Nonetheless, as the matter requires, the consideration here is that resilient strategies should be taught to people with lower socioeconomic status because these situations could be more ambiguous for them. Therefore, the role of other organizations on developing the adolescents to cope with life could be vital. Schools, teachers, peers can remarkably alter the perceptions these adolescents hold of stressful life events. Consequently, it is proposed that people with lower socioeconomic status be given more attention regarding the development of coping strategies for negative life events even in their neighbourhoods. The more adolescents from lower socioeconomic status have the support

of their schools, teachers, and peers, the more they can deal with life when exposed to latter life crises.

In a neighbourhood, residents may view their neighbourhood disorders in different ways but the pathway that can explain why some of these residents may not perceive neighbourhood disorders while they exist can be further explicated. It has been mentioned earlier that adolescents with from low and high socioeconomic status experience stressful life events simultaneously but what distinguishes them is that those from the low socioeconomic status lack support or coping strategies. This lack of support may lead them to develop plans about their life that are less likely to be positive and so, may lead to negative outcomes. The reporting of adolescents on stressful life events may result in their acquiring a negative general attitude about life.

Moreover, the availability to have access to facilities such as vehicles like cars may also alter their experiences of neighbourhood disorders. For example, adolescents who walk to and from schools have been reported to perceive more stress than others. One reason for this can be due to the financial strains their parents face and ultimately, they cannot afford to have a car. This indirectly suggests that there is no possibility for the parents to drop their children to or from school. In this case, it can be seen that such parents lack time which could be spent with their children and the more their children are exposed to the source of neighbourhood disorders, the more their children are likely to perceive more stress than others.

5.1.4.3 Individual factors' role on perceptions and experiences of neighbourhood disorders

Preferences for outdoor activities, neighbourhood satisfaction, and transportation mode come under the purview of individual factors which can affect the experiences and perceptions of neighbourhood disorders. The result of the current research showed that

adolescents' neighbourhood satisfaction was related to neighbourhood disorders. Adolescents/students who were more satisfied with their neighbourhoods reported lower neighbourhood disorders than others. This finding can be debated from two points of view. First, the neighbourhoods were ordered, and the adolescents concerned felt comfortable and safe in their living places. Therefore, they felt satisfaction and consequently, lesser disorders. Second, the neighbourhood disorders were there but the positive attitudes of the participants/adolescents led them to ignore the neighbourhood disorders. In the first case, there is no argument because clean and tidy neighbourhoods would be more pleasurable for the residents. They felt the safety and order of their neighbourhood and they were contented with the place, thus, the level of satisfaction is high.

However, one might argue this matter from the psychological perspective. For example, people with positive attitudes can control their environment better and implement their stress coping strategies faster than others. Hence, it could be said that adolescents who have positive attitudes towards their environment tend to view the environment positively even when faced with neighbourhood disorders; they tend to be less affected by them.

Based on the findings of the current research, it was found that there was a difference in the perceptions of neighbourhood disorders as viewed by adolescents who preferred outdoor activities. As the findings showed, they reported higher level of disorders as compared to others. Hence, it would be logical to deduce that if a person was outgoing, there is more likelihood of him/her being exposed to more neighbourhood disorders. However, this can be discussed in two different ways. First, if a person is outgoing, and the neighbourhood is disordered, the person might be affected by the harmful effects of the outdoor environment. Second, if a person has fear of outdoor activities such as

fighting, drunken people, burglars, or even road safety, he/she is more likely to prefer indoor activities such as screen-time.

In both cases, there were precarious effects of neighbourhood disorders; the first one with exposure to the neighbourhood disorders, and the second one with a decrease in the amount of physical activities involved. This occurrence can be attributed to various factors. For example, safety, as was mentioned before, could be one of the factors that prevent adolescents from participating in healthy outdoor activities. Protective parents might prevent their children from going outside. However, the factor of 'feeling safety' about the neighbourhoods is a complex theory to discuss for it includes many factors such as harmful strangers, injuries, or road safety.

Parents' concerns about their children's safety in the neighbourhoods are more related to road safety and strangers (Mullan, 2003; Carver, Timperio & Crawford, 2008). A study from England found that parents' concerns were mainly about road safety and stranger danger even though the neighbourhood provided adequate play facilities (Valentine & McKendrick, 1997). This finding suggests that even neighbourhoods with high levels of facility cannot be the place of physical activities for children due to parents' restrictions. Therefore, strategies to enhance the trust of parents in the neighbourhood are one of the most important factors to consider while attempting to make neighbourhoods an active place for children.

Another factor involves the factor of the individual level which involves transportation or the mode of commuting to and from schools. Transportation mode was related to the experience of neighbourhood disorders. Adolescent who walked to and from schools reported higher levels of neighbourhood disorders. This can be logically accepted because those who were using walkways/bicycling lanes were more at risk of facing

neighbourhood disorders. Adolescents who used taxis or parents' vehicles were less likely to see these neighbourhood disorders because they are driven in vehicles.

However, here the matter to be considered is whether or not walking and bicycling should be encouraged in the neighbourhood. If a person lives in a disordered neighbourhood it would be better, he/she uses parents' vehicles or taxis instead of walking and bicycling. It is also apt to mention here that some of the adolescents who were living in a disordered neighbourhood might be from the lower socioeconomic status than others. Thus, their families are unable to afford a car or vehicle for their every day journey. In such a case of adolescent, facing the neighbourhood disorders is inevitable.

In spite of all that have been discussed, there are instances where the parents' control of the transportation mode of the adolescents concerned and parental decision can be important in the choice of transportation. Parents who have the fear of outdoor dangers such as road safety or stranger are more likely to prevent their children from walking. Instead, such parents may prefer that their children travel via other modes of transportation such as school van or own vehicles. In the earlier section, it was discussed that children who walked to and from schools had more time to discover their surroundings and this can remarkably affect their brain development. Nevertheless, if this happen in a disordered neighbourhood, the health conditions would be worsened. Thus, it can be said that the factor of 'fear of walking to school' can change the habit of children from an early age till their future life. This effect on children can remarkably change their brain development, as mentioned above. However, it is unclear that using different modes of transportation and to what degree can change the brain development of the respective individuals.

This section had discussed the possible pathways through which neighbourhood disorders may affect the health and wellbeing of adolescents. In the next section, stressful life events of adolescents are debated upon with different factors such as socioeconomic status (parental income, education, employment status), age, gender, family functioning and individual character that are deemed to affect their stress-level.

5.2 Stressful life events for adolescents

The main findings of assessing stress-level extracted from the current research are listed as follows.

- About half of the students reported on moderately stressful life events.
- Academic life and future concern were the highest stressors.
- Romantic relationships and adults' responsibility were the lowest source of stress.
- Age and gender were not significant in the stress-level.
- Socioeconomic status was not significant in the report of stressful life events.
- Students who were dissatisfied with living environment had higher level of stress.
- Students who walked to schools had higher level of stress than others.

As has been stated previously, the second objective of the current research was to measure the stress-level of adolescents. Accordingly, the main findings drawn from the ASQ instrument found that 48% of the respondents/students reported moderately stressful life events. This is followed by 38% and 12% of the respondents/students who reported on the extent of 'little stressful' and 'quite stressful' with life events respectively.

Findings indicated that the top ten sources of stress include (1) too much homework, (2) concern about the future, (3) difficulty of some subjects, (4) having to study things they are not interested in, (5) not enough time to have fun, (6) putting pressure to meet the goals, (7) having to study things they do not understand, (8) not enough time for leisure

activities, (9) having to make decisions about future work or education, and (10) parents expecting too much from them.

The last ten sources of stress include (1) getting along with the boyfriend/girlfriend, (2) making the relationship work with boyfriend/girlfriend, (3) not enough time for the boyfriend/girlfriend, (4) breaking up with the boyfriend/girlfriend, (5) getting along with the teachers, (6) work interfering with school and social activities, (7) pressure to fit in with peers, (8) pressure to work to make money, (9) disagreements with father, (10) disagreements with teacher.

Of the stressors noted, it was found that academic related stress and future uncertainty had the highest average of report while the relationship status had the lowest report. The findings were drawn from ten different categories that might cause stress and they include home life, school performance, school attendance, romantic relationships, peer pressure, teacher interaction, future uncertainty, school conflict, financial pressure, and emerging adult responsibility. Further analysis showed that overall stress was related only to parental income, employment status, and students' satisfaction of neighbourhoods. In this regard, previous studies have shown that socioeconomic status might affect adolescents' stress.

Nonetheless, there are several pathways through which income and employment status can affect the health and behaviours of the children. One pathway, for example, looks at the effects of parental stress on children. Undoubtedly, financial strains can remarkably change parental behaviours at home, and consequently this could result in increasing the stress in adolescents. It seems that parent with less financial strains, and problems with their jobs can provide a better and more peaceful environment for their children at home. The results of assessing this association with each group showed that both parental income and unemployment status are linked to students' relationships with friends,

teacher, and home life problems. Thus, it would seem that parental income and employment status might cause the problem of social interactions for adolescents. The findings of the current research are consistent with previous studies (Silbereisen, Walper & Albrecht, 1990; Levine Coley, Eileen Morris & Hernandez, 2004).

Based on the outcome discussed, it can be argued that the association between parental income, and employment status and adolescents' behavioural problems with others can be caused by the lack of control by parents. Parents with such pressure as discussed above may have limited time for their children and this can in turn result in a huge volume of problems including academic performances, and social interaction problems as mentioned above.

Moreover, compared to the original ASQ that was conducted in Australia, it can be said that loaded items were the same in school performance, future uncertainty, school/leisure conflict but it was not so for other categories. Of course, the difference between the source of stress in countries like Australia and Malaysia can be different due to cultural differences, family environment differences, or even societal differences. This occurrence can be illustrated by the following. In a city like Kuala Lumpur, religious attitudes may prevent the students from dwelling on their romantic relationships from an early age but in Australia, romantic relationships were among the highest source of adolescents' stress.

In this section four main factors that were significant in the adolescents' stress are discussed in the following manner. First, school and academic related events of the students are presented, this is followed by parents and home related events, then adolescents' social interactions, and finally, their neighbourhood environment. It is believed that there is no unique factor that causes stress in adolescents as all of these factors can contribute to the adolescents' stress-level. In the current research, neighbourhood environment was added as a source to study adolescents' stress. This is

because the findings of previous studies showed that neighbourhoods are associated with adolescents' stress. Therefore, possible pathways are assessed via neighbourhoods which may affect adolescents' stress.

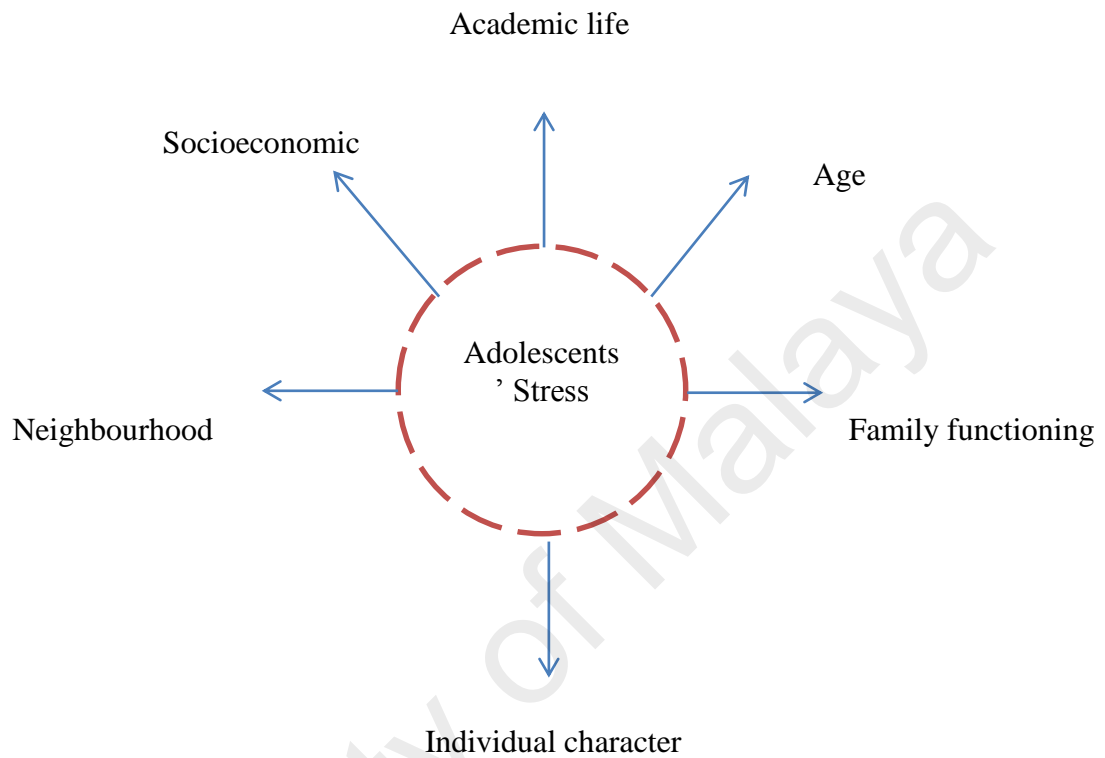


Figure 5.2: Significant factors contributed in the adolescents' stress-level

5.2.1 Effects of socioeconomic status on stress-level

A number of studies have investigated the role of socioeconomic status on adolescence and childhood (Chen, Matthews & Boyce, 2002; Hanson & Chen, 2007). As was shown in the current research, adolescents with lower socioeconomic status reported higher levels of negative life events, and this finding is consistent with previous studies (Brady & Matthews, 2002; Chen, Langer, Raphaelson & Matthews, 2004).

5.2.2 Academic life's effects on stress-level

The results drawn from the ASQ showed that academic stress was the highest source of stress among adolescents. Factors encompassing “too much homework”, “difficulty of subjects”, and “not understanding the topics” were the three top most stressful events. It is believed that academic stress may affect other aspects of adolescents’ life such as anxiety, time management and leisure satisfaction (Misra & McKean, 2000). The less stress a person has, the more control on time management he/she has. This ability can result in an enhanced life quality for the individual. In line with the discussion, it can be said that adolescents’ academic stress might also be caused by other factors such as poor socioeconomic status, family functioning or individual aspects and conditions of each person in the class (Malecki & Demaray, 2006). Nonetheless, in the current research, there was no significant association between academic stress and the other factors such as parental socioeconomic status.

The results of the current research are consistent with other studies conducted in Malaysia (Yusoff, 2010; Yusoff, Hamid, Rosli, Ayuni & Rahman, 2011). In the current research, it was noted that academic stress was the highest source of stress among the students. Moreover, it was also observed that schools and their related events play a pivotal role in students’ health. When the findings are compared to the findings of high-income countries, there is evidence to suggest that the relationships of families and their children and the cooperation of schools can help in reducing the academic stress adolescents’ experience. In addition, school environment and various programmes that can raise student’s coping strategies can remarkably help them to deal with such issues in their life.

Findings drawn from the current study had also indicated that adolescents reported academic life as being the most problematic of their life events. Further investigation may need to be conducted to assess what are other factors can cause them to experience

problematic life events other than higher levels of academic life. It has also been observed that adolescents from low socioeconomic status had more issues related to schools thereby suggesting that parents with low education level may be unaware of the need to guide their children in coping with their academic problems.

The same results were revealed when the factor involved parents' employment status. It was noted that adolescents whose parents had full time jobs experienced fewer problems in their study interests as compared to those whose parents were either unemployed or had part time employment. Indeed, many factors can contribute to the adolescents' academic issues. Their lack of interest in the subjects they were studying was related to their family background. This finding thus revealed that the role of the family is important when investigating the stress level of adolescents.

5.2.3 Family and home life's effects on stress-level

In looking at family and home life stressful events, the results of the ASQ showed that the item of 'parents expecting too much' of their adolescents was within the ten sources of stress reported. When the ASQ was compared to the Australian version of ASQ, disagreement between parents in the current study loaded first but in the Australian version, it was loaded second. Nonetheless, in this study conflict with parents was not included in the top sources of stress. For further evaluation, the stress analysed in respect to the other factors should include parental socioeconomic status (income, education, and employment), family functioning, age, and gender. Among all of these factors, parental income and employment status were the only significant factors that showed association with adolescents' stress. This too has been shown in previous studies (Silbereisen et al., 1990).

The results of the current research showed that both low income and unemployment status were related to the stressful events in categories of romantic relationships, peer pressure, and home life problems. It appears that both parental income and employment status might cause the problem of social interaction among adolescents, whether in their romantic relationships, with friends, or teachers. It is possible that such parents may be spending more time on resolving their financial problems and less time to control their children's behaviour with others.

Conflict with parents was among the least of the sources cited for causing stress among the adolescents. However, the importance of family functioning emerged as a cause in a study (Krishnan, 2004, p. ii). It was shown, for example, large amounts of conflict and disagreement with fathers could adversely be related to self-esteem among boys and the occurrence is high.

Other studies conducted in Malaysia (Baharudin, Krauss, Yacoob & Pei, 2011) also showed the significant role of family in early adolescents' social behaviours. It was noted, for example, that single parent families tended to have a lower score of family functioning as compared to other family structures. The lower score of family functioning would be positively related to anti-social behaviours among early adolescents from such families. In addition to family processes, the contributions of selected family background variables on early adolescents' anti-social behaviours were also important.

5.2.4 Neighbourhood satisfaction's effects on stress-level

The finding of the current research showed the association between students' stress and their satisfaction with their neighbourhoods. The more stress an adolescent has, the more he/she disliked the living environment or vice versa. One possible pathway is to focus on the positive attitudes of the individual. A person who has positive feelings towards the living environment, for example is likely to report on lower stress levels. Another

pathway is to look at the use of outdoor facilities to relieve stress. Neighbourhoods with parks and green spaces have the effects to reduce stress among residents, therefore, the person who has high levels of stress and is living in a deteriorated neighbourhood would have a lesser chance of coping with the stress as a result of the lack of green and friendly living environment.

The role of the neighbourhood environment and satisfaction has been illustrated in previous studies which agree that urban green spaces can change behaviours in a positive way. This result is also shown in previous studies such as Wells & Evans (2003) who found that children living in a greener and better environment have lower psychological distress when experiencing stressful life events. However, it can be discussed that in a city like Kuala Lumpur, the allocation of more land to be used to build green spaces may not be possible due to the limitation of land and also the high prices of land.

In order to assess whether the satisfaction of adolescents on their neighbourhood may be related to the quality of areas, this study investigated the living places of those who were satisfied with their neighbourhoods. It was observed that the living places of adolescents who were satisfied with their neighbourhood were experiencing green spaces, park, and facilities than other areas. One may thus argue that green spaces can remarkably promote the positive feelings of residents.

Moreover, a person who is satisfied with the neighbourhood can experience more physical activities outside of home. Physical activity is also protective against stress and in adolescents, physical activities can dampen acute stress reactivity, and can also buffer the effects of chronic stress on adiposity and health. Thus, positive feeling about the living place can motivate the person towards having more activities outside. This benefit can be interpreted from the physiological aspects too. Positive feelings and conducting physical activities both release the hormones in the brain that reduce stress and stress effects on

the body. However, outside activities are not limited to exercises alone for it also involves different activities such as walking, jogging, bicycling, and even social interactions and hanging out with friends.

Another benefit of satisfaction gained from the living places is that it reduces the screen hours of adolescents. It was explained before that having negative feeling about the neighbourhood also resulted in screen hours among Malaysian adolescent. Therefore, a person who could communicate with the environment is unlikely to spend most of his/her time on the screen. Screen hours can change the behaviours and brain development of the individuals and can lead to the development of different diseases such as depression or anxiety. In this regard, having an ordered neighbourhood can indirectly promote the health conditions of youths.

Further to the above findings, the current research also showed that academic life and future concerns were among the top stressors as reported by adolescents. From this finding, it can be argued that thinking about their academic experiences and future can remarkably affect their health and life outcomes. This occurrence may be attributed to their lack of support from schools, teachers, family, peers, or the social environment they live in. Conversely, if there is support from the relevant parties, their health and life outcomes would improve. More of this will be discussed exclusively in the subsequent sections.

5.3 How are neighbourhood disorders related to adolescents' stress-level?

Overall, the finding extracted from the third objective showed that there was a positive association between neighbourhood disorders and stress. The following are the highlights drawn from the research findings related to the association between neighbourhood disorders and stress.

- Neighbourhood social and physical disorders related to the stress level
- Age and gender increased the association between neighbourhood and stress
- Family functioning increased the association between neighbourhood and stress
- Socioeconomic status including parental income, maternal education, paternal education, and employment status increased the association between neighbourhood and stress
- Individual factors including the neighbourhood satisfaction, preferences of outdoor environment increased the association between neighbourhood and stress.

This result is consistent with the previous study showing the link between neighbourhood disorders and adolescents' stress (Theall, Drury, & Shirtcliff, 2012). It needs to be clarified here that the association between the neighbourhood context and stress was mediated by other factors such as socioeconomic status, family functioning, and individual attitudes. The idea that neighbourhoods' effects are complex and can interact with other factors at the individual and interpersonal-level was already showcased in previous studies (Diez Roux, 2001; Aneshensel, 2010; Cagney & Cornwell, 2010; Diez Roux & Mair, 2010; Mair, Diez Roux & Morenoff, 2010).

The results of the analysis extracted from the current research also showed that stress-level is more associated with perceptions of social disorders. It can thus be said that social context can have a direct effect on mental health. This finding is consistent with other studies investigating similar fields and their results too proved that social context can lead to radical mental changes and other behaviours among people (Aneshensel, 2010). Further, the findings of the current research showed that there is a distinction between experience and perceptions in the association between neighbourhoods and stress. It was noted that the association was more related to social context in both experiences and perceptions than to the physical setting of neighbourhoods.

In addition, results drawn from the spatial analysis conducted had also shown that some neighbourhoods had higher level of disorders and higher levels of stress were reported by adolescents. As was mentioned above, the association between neighbourhood and stress could be further exacerbated by other factors. This means that once this correlation is assessed, it is difficult to ignore other factors. However, it has to be noted too that this association can be very complex and complicated. These factors had already been highlighted and it was also explained how neighbourhoods can affect adolescents' mental health. As was earlier shown, the final pathway included the five factors of socioeconomic status, age, gender, family functioning, and individual character.

5.3.1 Role of age and gender on the association between neighbourhood disorders and stress

As the results of this study had shown, age and gender increased the association between neighbourhood social and physical disorders and stress among adolescents. This finding is also consistent with other studies looking at the effect of age and gender on the perceptions of neighbourhood disorders when reporting stress-levels. Previous studies had shown neighbourhoods' effect on the antisocial behaviour among different age and gender groups (Ingoldsby & Shaw, 2002).

Recent studies of this field had made more emphasis on the role of age and gender in the perceptions of neighbourhood problems (Hudley, Wakefield, Britsch, Cho, Smith & Demorat, 2001; Kaczynski, Potwarka, Smale & Havitz, 2009; Kimbro, 2009; Chen et al., 2013). It was noted that boys, for example, were more likely to start antisocial behaviours than girls in early adolescence. Boys might require more monitoring than girls in the neighbourhoods, whilst girls may need more protection against disorders than boys. Therefore, the difference between age and gender could be important considerations when focussing on health.

The current research also assessed the role of transportation for each age group. As was shown earlier, younger adolescents tended to walk to and from school more than older adolescents. This can justify the reasons why there was a difference between the different age groups when reporting on their experiences of physical disorders. Indeed, walking or even bicycling provides the situation for them to face the physical disorders such as garbage, litters, cigarette on the sidewalk, or graffiti more than others.

Furthermore, as was discussed before, even if guidelines such as green neighbourhood was applied, there could still be challenges. The guideline for instance, recommended increasing walking pathways, but this would not effectively change adolescents' health if the physical disorders remained high. Indeed, the implementing of such plans would also require integrations not only in adding the walking and bicycling lanes but also in reducing both social and physical disorders of neighbourhoods. Perhaps, once the number of neighbourhoods with pedestrian friendly spaces increase, people including adolescents, with fear to use it due to physical disorders and hygiene matter or social disorders and fear of fight or strangers would also increase. Therefore, to ensure that such a recommendation can be effectively planned, all sectors should cooperate further to build a healthier and more active community.

Enhancing one aspect of the neighbourhood would not effectively change the condition of the neighbourhood without other aspects being changed. This is because the neighbourhood is an integrated unit of a city and the city consists of many aspects such as social, physical, and environmental. Therefore, the pivotal role of neighbourhood in people's health status, integration should be emphasised.

5.3.2 Parental Socioeconomic status's effects on the association between neighbourhood and stress

The pathway through which socioeconomic status can increase the association between neighbourhood and adolescents stress can be discussed in many ways. One is that there is more possibility that parents with low income cannot afford the newly designed houses in an area that is considered as high quality. Therefore, they would continue to live in a low quality area and such areas are also most probably highly disordered neighbourhoods. Due to their low socioeconomic income, parents may spend more time solving their financial strains and less time on building their relationships with their children. In this regard, the children would be more affected by neighbourhood disorders. For example, living in a deteriorated neighbourhood and a low-class family may decrease the children's chances of coping with stressful life events. As was mentioned before, income and unemployment status were related to the social interactions of the adolescents being investigated.

Findings also provide the preliminary set of data which suggest that the direction of some of the associations between neighbourhood context and positive parenting style or behaviours depend on family income. Specifically, lower-income parents may exhibit lower levels of positive parenting style and behaviours in the context of higher levels of Neighbourhood Danger and Disadvantage (Chung & Steinberg, 2006), but middle-income parents may exhibit higher levels of positive parenting in this context (Vieno, Nation, Perkins, Pastore & Santinello, 2010).

As such, whereas relatively higher income parents may have the capacity to ramp up their positive parenting in response to the presence of neighbourhood danger and disadvantage, there may be more constraints on low-income caregivers to do the same, as has been noted in the discussion above. Similar to the case with disengagement, which was discussed in

the above section, it is likely that low-income caregivers in neighbourhoods with higher levels of danger and disadvantage have fewer opportunities to observe other residents in the community engaging in high levels of positive parenting behaviour as compared to middle-income caregivers. This corresponds to the building on Social Disorganization theory and Epidemic Models of behaviour (Jencks and Mayer 1990; Sampson 1992).

Alternatively, other residents in the same neighbourhood are also of lower socioeconomic status and experiencing the same financial and economic stressors (e.g., working multiple shifts, experiencing health problems) and this phenomenon impedes their ability to engage in a positive parenting style too. When this occurs, it would result in fewer reinforcing models for positive parenting to occur in the community. Due to the small body of work done on this area, it would be thus be helpful for future studies to examine the moderating role of family income in associations between neighbourhood context and positive parenting to determine the nature of these associations.

5.3.3 Family functioning's effects on the association between neighbourhood and stress

As the results of the current research showed, the association between neighbourhood and stress has been changed by family functioning. One reason could be, families can prevent their children from facing disorders in their neighbourhoods. The results showed that family functioning was important in the association between neighbourhood disorders and stress. This result is consistent with other research that focussed on the mediating roles of family functioning in the association between neighbourhoods and adolescents' behaviours (Spencer, Cole, Jones & Swanson, 1997).

From the findings, it seems that adolescents who enjoy a good relationship with their parents were less affected by the neighbourhood disorders. In this study, it was found that family functioning was not only considered through the parents' relationships with the

children but also in the roles they played in their children's lives such as traveling to and from schools. This study had provided evidence to indicate that adolescents who commute to and from school with their parents' cars have lower level of stress than those who walked. Therefore, it can be deduced that the role of the family even in transportation mode's selection, can decrease the degree of adolescents facing disorders in the neighbourhood. Parental restrictions, it is argued, can change the adolescents' behaviours in the way they regard their living place.

In the current research, the adolescents were categorised based on their report of stress and neighbourhood disorders into three main categories. The first category had reported both high levels of stress and neighbourhood disorders. The second category had reported both low levels of stress and neighbourhood disorders. The third category had reported either high level of stress with low level of neighbourhood disorders, or vice versa. For each category, family functioning was considered.

In the first category, adolescents had reported low levels of stress and neighbourhood disorders. In this category, majority of the parents had also reported that they have 'somewhat well' or 'very well' functions in the status of functioning. This group had fewer problems in handling issues with parenting or the child's problems. They also reported having others' support in nurturing their children. This seems to suggest that they were able to control their child either 'very well' or 'somewhat well'. Consequently, adolescents had lower stress level as well as lower experiences or perceptions of neighbourhood disorders.

In the second category, adolescents had reported high level of stress and neighbourhood disorders. As family functioning was assessed for this group of adolescents, the results revealed that majority of the parents had reported 'somewhat well' or 'not very well' in the status of functioning. This group had reported having more conflict with their child

and they also reported a higher level of getting angry with their child than other categories. In this regard, it can be assumed that the child would be having fewer skills to cope with his/her own problems. They would ultimately feel stressed and pressured as they grow. This category also had negative attitudes towards their living places, and they were not satisfied with their neighbourhoods. Under this category, the group of adolescents could be assumed to be more at risk of life's crisis than other categories because they have no support from both the family and their neighbourhood environment. Failure to adjust to the environment is more likely to happen and they may experience excruciating life events more than others.

In the third category where adolescents who made ambiguous reports of stress and neighbourhood disorders, family functioning was also considered. In this category, adolescents had reported both high level stress and low level neighbourhood disorders or vice versa. According to the family's report, majority of the parents had reported that they could handle the parenting functions to a degree of 'somewhat well'. However, the difference between this group of adolescents and the previous category is the parents who reported that they handled parental functioning 'not very well'. In this category, the number of parents who could not handle the parental functioning 'very well' was less than the previous category. However, the group of adolescents in this category would be facing events of life's crisis less than the previous group because more than half of the adolescents received parental support.

It is also noted that conflicts between parents and children can alter the children's behaviours and this might cause them to experience higher levels of stress. For example, the conflict between parents and adolescent can lead the child to spend their time alone. It would be ideal for adolescent having conflicts with their parents to increase their outdoor activities and spend their time outdoors, but this is not always possible. Hence, it

is no wonder that in this case, the child's exposure to the neighbourhood disorders is high. The results of the current research had shown that parents who had conflicts with their children were mostly those from the low socioeconomic status groups, and most were also living in disordered neighbourhoods. Therefore, it can be deduced that adolescents who have conflict with their parents, and family could not handle their functions 'very well' and so they would ultimately be more exposed to the neighbourhood disorders. Undoubtedly, this category of children would also have lower skills and coping strategies than others. Consequently, when they are faced with neighbourhood disorders, there is more possibility that they would be affected by them. Thus, these factors can affect their health status by increasing the stress level.

5.3.4 Effect of Individual-level factors on the association between neighbourhood and stress

It was illustrated before that the individual's character can remarkably affect his/her perceptions of the neighbourhood disorders. This individual preference includes preference for the outdoor, neighbourhood satisfaction and transportation mode to and from schools. The following section discusses each of these factors.

Adolescents who preferred outdoor environment reported higher levels of perceived disorders than those who preferred indoors. This could be due to either their family background or individual characteristics. For example, some adolescents may be controlled by their family to indoors. This can result in the adolescents perceiving lower level of neighbourhood disorders because they had fewer chances to face their environment. However, in this case, the adolescents involved still experience fear and so the social disorders reported were high. It can be deduced that even though a person might not have seen disorders, he/she could still hear stories about fear or meet someone who had experienced fear. Thus, fear of problems, as a factor, can be just as important in

investigating neighbourhoods' effects on health. It may be seen that spending more time indoors rather than outdoor could very likely decrease the level of exposure, but the fear of disorders is still there.

Further, another way to assess how neighbourhood disorder can change the health status of adolescent is to see if the person chooses outdoor activities such as hanging out with friends in their neighbourhood areas or playing in the parks or open spaces. There is a possibility that when they do, they would be facing the neighbourhood disorders directly. Social problems such as fights and people loitering can increase the negative feelings of these adolescents. The negative feeling they acquire may affect other aspects of their life as well, and consequently, reduce the quality of life for those adolescents. If the number of people who live in a society held negative feelings about others or about their environment and their number increases, the phenomenon can also affect the entire community's health as well.

The other factor chosen to assess neighbourhood's disorders and stress was a preference for indoor environment and screen time. A study from Saimon et al. (2013) had discussed that many adolescents had reported a preference for indoor activity either because of their parent's control or their fear of outdoor environment. To sum up, it can be said that living in a deteriorated neighbourhood that lacks the provision of a safe environment for young people to spend time after school, may alter the health status of the adolescents. It is either a person spends time in an unsafe environment or spend time in a closed area at home and screen time.

A critical matter in the investigation of neighbourhood effects is to look at how individual-level variables can contribute to the development of conceptual models and thereby enable a better analysis. The most rampant denigration of suggested neighbourhood effects was the result acquired from perplexing individual-level variables.

People may be grouped into neighbourhoods according to individual characteristics, and these individual characteristics may be related to health outcomes. As a way to respond to these critiques, studies have attempted to control the individual difference variable which is the most common of indicators in social positions. In this regard, some studies have emphasised a special point for controlling individual-level social position indicators via stratification and multivariate adjustment. Short of randomization, these adjustment strategies are the best way to analytically demonstrate the effects of neighbourhood on health.

However, the relation between neighbourhood characteristics and individual-level socioeconomic position is a complex one. It cannot be denied that neighbourhoods influence the life chances of individuals and that a neighbourhood's social and economic characteristics may be related to the health of its residents based on their effects on achieved income, education, and occupation. All of these can make these individual-level characteristics mediators (at least in part) rather than confounders.

In addition, because socioeconomic position is one of the dimensions along which residential segregation occurs, living in disadvantaged neighbourhoods may be one of the mechanisms that can lead to adverse health outcomes in persons from low socioeconomic status. Because of this, it can be said that although teasing apart the "independent" effects of both dimensions may be useful as part of the analytic process, it is also artificial.

Further complexity had also resulted from the fact that, in some cases, neighbourhood and individual characteristics may mutually influence each other. For example, the availability of healthy foods in a neighbourhood may influence the dietary behaviours of individuals. Conversely, individuals' behaviours may in turn affect food availability.

An attempt to understand an area or a neighbourhood's effects on the health status of the residents may require the testing of hypotheses which involve such dynamic and reciprocal relations. In this regard, the methods most commonly used in epidemiology today may not be well suited in the case of examining these reciprocal and dynamic relations. Area- and individual-level characteristics may also interact for instance, the effects of individual-level variables may differ by contextual characteristics, and the effects of contextual characteristics may differ by individual-level variables. In this regard, gradients caused by individual-level income, for instance, may be stronger in poor neighbourhoods (where those with low incomes are unable to gain access to resources outside the neighbourhood) than in rich neighbourhoods (where the comparative advantage conferred by high income is not as great).

Alternatively, an increase in individuals' level of income may confer little advantage in the presence of a neighbourhood that is deprived. It would seem that the effects of individual level social position may be stronger in richer neighbourhoods. A few studies have investigated the interactions between neighbourhood socioeconomic characteristics and individual level social class indicators (Pearl, Braveman & Abrams, 2001; Pickett & Pearl, 2001), but the results have not been fully consistent when looking at the types of interactions present. Further, interactions between area characteristics and other individual-level factors have been less commonly investigated. Some studies have examined, for example, on whether a rise in reproductive risk with maternal age differs by community characteristics but thus far, there is no clear evidence of an interaction. Pearl et al. (2001) have assessed whether the effects of neighbourhood characteristics on birth weight differ by race/ethnicity. The results seem to suggest that the meanings and implications for health, of different neighbourhood environments, may differ across ethnic groups. The development and testing of specific hypotheses regarding interactions may help to enhance our understanding of the processes involved.

5.3.5 Hot spots in the city with high-level of reported stress and neighbourhood disorders

As the findings had shown, there is overall clustering of stress as reported by adolescents in Kuala Lumpur, Malaysia. Indeed, the distribution of residents with the same stress-level was significant. Local indicator analysis method had revealed that there were some neighbourhoods which were clustered in the report on stress and neighbourhood disorders. Indeed, spatial analysis can remarkably help to detect where the hot spots in the cities are.

In Kuala Lumpur, *Taman Setapak Jaya*, *Taman Setapak Indah*, *Taman Tengah Ehsan*, *Taman Hijau*, *Taman Bukit Tunku (Kenny Hill)*, and *Bandar Sri Permaisuri* were recognized as the most problematic areas in the city. Adolescents who lived in these neighbourhoods had reported both higher levels of stress and neighbourhood disorders. As the observations and the Google street view had shown, most of the buildings located in these areas are dilapidated and old. It also appears that these building were too crowded and the areas were mostly occupied by cars which were parked outside these buildings. Therefore, it would be plausible to assume that an adolescent living in this kind of neighbourhood would feel unsafe, uncomfortable, and unsatisfied.

Further, it was also noted that *Jinjang Baru*, *Bandar Manjalara*, *Bunga Raya*, *Bukit Maluri*, *Taman Desa Petaling*, and *Desa Pandan* were neighbourhoods where adolescents reported high stress-levels. Spatial analysis method could be a useful tool to use in order to find out how neighbourhoods might be related to mental health outcomes. A failure to use this may result in errors in the study (Cromley et al., 2012). The findings drawn from the current study suggested that there were a variety of factors which were associated with the stress-levels reported by the adolescents. Nonetheless, the effects of

neighbourhoods on mental health can vary from place to place even in places with the same neighbourhood disorders.

Moderating factors such as age and gender can change this association. The distributions of stress across the neighbourhoods investigated revealed that there were some areas in all the zones that could be considered as problematic areas. This means some areas might be highlighted as problematic in terms of neighbourhood disorders, but there are adolescents in other areas who are at risk of environment hazards too. This indicates that the need to provide services in other areas is not as visible as the highlighted areas. Therefore, identifying the priority of the delivery of service is an important outcome of spatial analysis of mental health.

The current research had aimed to identify adolescents who could be most at risk of experiencing negative mental health outcomes by using the model which focuses on neighbourhoods and matching the reports of the adolescents with factors that are related to low socioeconomic status and parental functioning that was not working very well. It was found that adolescents had reported high levels of stress and neighbourhood disorders.

SUMMARY

This chapter was divided into three sections, Section one explained the possible pathways through which adolescents experienced and perceived neighbourhood disorders. Factors such as age, gender, family functioning and individual character role and its association with the experiences and perceptions of neighbourhood disorders were discussed. Section two explained the important life stressors experienced by adolescents. In this section, academic issues were identified to be the most stressful life events for the adolescents in the research. Section three provided the arguments to justify why neighbourhood social and physical disorders might be related to stress. Other factors such as age, gender, family functioning, and individual character were identified to be the pivotal factors that could affect the adolescents' health radically.

CHAPTER 6: CONCLUSION

Followings is the explanation about the research significance, contribution to the knowledge according to the research objectives, policy implication, limitations of this study, and finally possibilities for the future researches.

6.1 Research significance

The main findings of this study had shown that neighbourhood disorders are associated with mental health outcomes. Neighbourhood disorder was the concept that was introduced before in other context, this study proved that neighbourhood disorders can be traced in Malaysia as well. Neighbourhood disorders have been linked to stress-level, therefore, the importance of recognizing these phenomena can be vital for the future plans. Recognizing the areas which are at higher risk of neighbourhood disorders would help planner to make the city healthier, safe and more active. This accordingly is of vital importance to the citizens of metropolitan city which the rate of mental health disorders is becoming higher with the increase in the population.

In the case of disorders, it was found that physical disorders were more prevalent than social disorders. However, the social disorders had provoked more sense of fear and stress. Therefore, one of the main significance of this study was to show the distinction between different types of disorders which can affect adolescents' health. in terms of fear, social disorders are more important while, physical disorders were more often found in the neighbourhoods. Though, this study showed that to have a better future for the city, it is important to take both aspects into considerations.

6.2 Contribution to the knowledge

The first objective which was achieved through this research was about existence of neighbourhood social and physical disorders. The main contribution of this objective into this field of study is introducing the concept of neighbourhood disorders in Malaysia. This can remarkably help the future study in this field and exploration more about the effects of these problems on current situation and consequently in the future of urban planning. The second objective was about the stress-level measured by Adolescents Stress Questionnaire. This instrument has been used for the first time in the Malaysian sample, and can be the references of further study on adolescents' stress-level in Malaysia. The last objective was about the association between neighbourhood social and physical disorders and adolescents' stress. This was the major aim of this study to find if we can interpret adolescent's stress based on their neighbourhood conditions. This would help to a better understanding of the association between mental health and the built environment and it was proved that mental health can contribute to the adolescents' stress-level.

6.3 Policy implications

There is no doubt that building policies in conjunction with the cooperation yielded by the residents should be implemented in order to achieve some order in the society. As has been discussed, experiences and perceptions of neighbourhood disorders are important in both social and physical disorders. Therefore, law and policy makers should ensure that there is an emphasis on all types of neighbourhood dimensions. However, current steps promoting liveable cities and green cities are seen to be the best of practices but other aspects should also be considered in enhancing the quality of future urban areas. There is a need to establish the priority for providing such services. Indeed, there are areas or regions with higher level of neighbourhood disorders that would require immediate services and consideration.

The vision for achieving a better quality of life must be based on a long-term policy and not a short-sighted vision that works for a temporary period of time. In this regard, policy makers may be able to solve these issues highlighted by interacting with other organizations or entities that are closely working on the social and physical concerns of adolescents. If policy makers can absorb all the organizations and institutions into their network to closely work with adolescents, then helping the adolescents to cope with stress can be done faster and more efficiently. This can then bring on a radical change in the society faster than what is happening currently.

Strategies that aim to enhance adolescent's health status should also integrate the implementation of actions at the family, school, peer, neighbourhood, and individual level. As was stated by the social determinants of health in World Health Organization (WHO), there are certain steps one can take towards building a healthier life. First is by enhancing the circumstances in which people are born into, grow, live, work, and age. The neighbourhood is the place where daily interactions of people occur. Therefore, addressing the risk and protective strategies and instilling awareness about these factors in families can be just as important. It is also fortunate that the harmful effects of social or even physical disorders are preventable with the cooperation of schools and families.

The second step is to tackle the inequality of resources such as money and power. Structural changes are required to motivate adolescents in regards to facing the obstacles, and to increase their wealth and well-being. As these adolescents move to independency in older age, they would also require more support from society to cope with the relative stresses. The fear of poverty and handling life crises can be reduced by making changes in national employment policies, student support, and duties. Making an effort to decrease the number of unemployment among the residents of a neighbourhood can remarkably help a neighbourhood to be less socially disordered.

Planners and policy makers should ensure that neighbourhoods are built with adequate green spaces. The availability of such places which are located within an appropriate distance has the potential to promote mental health status. Land use planners should make sure that there are good quality parks and green spaces. Another matter to consider in this regard is safety. A very advanced and facilitated neighbourhood may remain inactive due to the lack of safety. Gated and guarded neighbourhood can greatly enhance the safety of neighbourhoods.

Moreover, as discussed in the previous chapter, academic stress has been cited as one of the biggest issues faced by early adolescents. Therefore, it is necessary to mitigate the harmful effects of such stress and its reflection in the society. In this regard, adolescents' behaviours when faced with academic stress can be lessened through the support of schools and families. In the family perspective, providing adolescents with a peaceful environment in the family can enable the adolescents to cope better. This means that if the government or officials have the intention to enhance the quality of adolescents' health, they cannot ignore enhancing the family environment. Providing services at the family level can ultimately promote good performances of the children, and as a consequence of their good performance, they get more supported by their families.

The other matter to consider is that the works of researchers and scientists need to be more effective so that they become involved in policy making and rule making. They need to work together with other organizations. This can be done for example, by making data and results accessible to health organization, education institutes, researchers' network, and all other related organizations which can then incorporate the findings into their actions. The findings of this research had shown that some neighbourhoods have high level of disorders and the people living there are at risk of various health issues. This information, thus, should be made available to planners and health professionals for the

information to be considered in their next planning scheme and guidelines. To effectively change the situation of current neighbourhoods in Malaysia, a network consisting of all related research and projects should be set up. This network can allow policy maker to act more quickly. The variation of the organizations may make the decision making process slow thus, a unit is required so as to organize all the research, project rules, and etc. which are related to neighbourhood matters including its sustainability. However, neighbourhood sustainability relies not solely on the design of the neighbourhoods but also on their social, physical and environmental settings. As mentioned earlier, to see a radical change, all the various components proposed earlier should work together. An emphasis on just one of those components may not alter current circumstances.

In conclusion, it can be said that to enhance the quality of adolescents' mental health, the cooperation of all organizations including education and health bodies are required. This can accelerate the number of healthy adolescents to increase as well as promote a healthy society, as a result.

6.4 Limitations

A number of limitations inherent in the current research should be noted as they affect the interpretation of the study results and are related to the future directions of research focussing on neighbourhood disorders and stress. The limitations of this study are mainly divided into categories which include the design of the study, instruments, lack of data, and methods of analysis. Of course, every research has its own limitations but these limitations can be considered in future studies so as to improve the knowledge in this field.

One of the most significant limitations of this research is pertaining to the study design, which uses only cross-sectional assessments of neighbourhood disadvantages. Recent research had indicated that the effects of neighbourhood disadvantage exert stronger influences on health from childhood. Thus, a longitudinal study is required to find out how neighbourhood disorders can affect and cause radical changes later. However, for this research, pursuing a longitudinal study is not possible due to the limited time.

The other limitation is pertaining to the size of the study area. The design of this study allowed an assessment to be conducted on 62 neighbourhoods out of 238. However, to have the perfect results, all of the neighbourhoods should be considered in the research. Also, the results of spatial analysis would be more valid and reliable by involving all the neighbourhoods. In this study, only participants from those neighbourhoods were considered. Therefore, there were a limited number of participants involved in this study. In addition, to generalize the results of the study at the national level, there is a need to involve all the states located in Malaysia in the research. In the case of this research, the findings cannot be generalized to the whole of Malaysia as it was conducted only in the capital city of Kuala Lumpur.

Additionally, this study had proposed that neighbourhood disorder is associated with psychological stress through the involvement of other factors such as family functioning, socioeconomic status, and individual character. However, these are not the only factors that contributed to the adolescents' health. A cross-sectional analysis of neighbourhood effects tends to also ignore residential mobility although the population is fairly stable, and those who moved tend to move to neighbourhoods with similar levels of disadvantage. Also, the neighbourhood dimensions that were assessed encompass only neighbourhood social and physical disorders.

Thus, it can be said that to have a better understanding of this association, other factors such as environmental disorders (e.g. toxins) or residential mobility and peer effects need to be considered in the study. In the case of this research, adolescents were asked about the status of their smoking behaviours, and it was associated with neighbourhood disorders. Why and how neighbourhood disorders are linked to parents' and peers' smoking had not been investigated here. The underlying mechanisms through which parents' and peers' smoking behaviour can change perceptions of living places should be considered. As a limitation, this study did not consider the complicated model of this association. Developing and using moderated mediation or mediated moderation models can add to the knowledge in this field.

It is clear that some groups of people living in disordered neighbourhoods might have difficulty to be identified as a sample. Therefore, conducting the research sampling methods for neighbourhood research can be just as important. New methods are required to find the right participants for future studies.

6.5 Directions for Future Research

As a recommendation, the directions for future study can be done in eight methodological frames such as developing instruments to measure the neighbourhood disorders for specific tropical countries, or seeking adequate theoretical directions such as definitions of neighbourhood in health studies, and so on. The following are recommended for future directions and future research.

Investigating the relation between areas or neighbourhoods and health may require using several different research designs. Quantitative studies need to include data drawn from both individuals and the areas in which they live as other studies have done. Ideally, an adequate number of neighbourhoods and number of individuals per neighbourhood

should be included so as to allow examination of within and between neighbourhood variability in the outcomes and in the factors associated with them.

Ensuring a sufficient range in the types of neighbourhoods selected is also important. People change neighbourhoods over their life course, and neighbourhoods themselves may also change over time. Although several longitudinal studies have investigated the relation between neighbourhood characteristics and mortality or incidence of disease, most research had relied on using the measurement of neighbourhood environments at one point in time. The cumulative or interacting effects of neighbourhood environments measured at different times over the life course, the effects of duration of exposure to certain neighbourhood conditions, the effects of change over time in neighbourhood characteristics, and the impact of moving from one neighbourhood to another have not been systematically examined.

This study had alluded to the contents of studies that had explored residential history or patterns of exposure to various community conditions in examining community effects on low birth weight. Investigation in these longitudinal and life-course dimensions would require study designs that follow both individuals and neighbourhoods over time. Studies linking census data for areas to individual-level data on health outcomes and covariates will continue to be of use. The studies illustrated in this research had highlighted some of the possibilities of these data linkages. The systematic way in which area data are collected for the entire population makes census-based measures a valuable resource, despite limitations of the geographic areas available and the absence of direct measures of potentially important neighbourhood-level processes.

This research worked on neighbourhood problems, not crime. The distinction between different neighbourhood problems such as minor and major crimes can be assessed. For example, kidnapping and burglary that are counted as major crimes had not been taken

into account in this research. Therefore, this distinction and its severity can be the main topic of other researches. Next, researches and studies can emphasise more on spatial analysis method as part of the pathways between neighbourhood disorders and stress. Spatial analysis can remarkably help others to better understand this association. The reasons why some parts of the Kuala Lumpur neighbourhood have higher disorders can be assessed in terms of the history of each area. For example, what factors could contribute to enhancing the disorders of each neighbourhood? This can help to prevent the existence of highly disordered neighbourhoods in the future rather than having active, organized, and ordered living places. Other outcomes of mental health such as depression and anxiety can be investigated in respect to the neighbourhoods. Furthermore, this study was conducted among adolescents, so older adults' diseases or chronic mental health disorders such as schizophrenia can also be investigated.

Change in the behaviours among residents in the neighbourhoods is another topic for further investigations. An example is investigating if people with an affinity for smoking tend to gather in areas with less quality or whether negative personal perceptions can influence other aspects of life such as choosing friends. There is also a scope for further investigation of the context in which neighbourhood disorders may lead to a high prevalence of smoking. Despite the large body of literature, scholars believe that this area of research is in its methodology and conceptual infancy. It is clear that there are complex pathways between adolescents' active places and health outcomes and there is a need for comprehensive models to be developed which can explain all the variables across different conditions and statuses.

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