

---

## PUBLIC HEALTH RESEARCH

---

# Neighbourhood Factors on Mental Health Questionnaire: Development, Validity, and Reliability among Malaysian Adolescents

Zahir Izuan Azhar<sup>1,2</sup>, Shamsul Azhar Shah<sup>2,4</sup>, Susan MK Tan<sup>3</sup> and Syed Sharizman Syed Abdul Rahim<sup>2</sup>

<sup>1</sup>Department of Population Health and Preventive Medicine, Faculty of Medicine, Universiti Teknologi MARA (UiTM), Selangor, Malaysia.

<sup>2</sup>Department of Community Health, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

<sup>3</sup>Department of Psychiatry, Faculty of Medicine, Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia

<sup>4</sup>UKM Molecular Biology Institute (UMBI), Universiti Kebangsaan Malaysia, Kuala Lumpur, Malaysia.

\*For reprint and all correspondence: Zahir Izuan Azhar, Department of Community Health, Faculty of Medicine, UKM Medical Centre, Jalan Yaacob Latiff, Bandar Tun Razak, 56000 Cheras Kuala Lumpur, Malaysia.

Email: drzahir@salam.uitm.edu.my

### ABSTRACT

---

<b>Received</b>	21 March 2016
<b>Accepted</b>	31 March 2016

**Introduction** The risk factors associated with mental health among adolescents are usually described by researchers at an individual level. Neighbourhood factors and health have opened a new insight into the field of epidemiology. The aim of this study was to assess the reliability and validity of a newly developed Neighbourhood Factors on Mental Health Questionnaire among Malaysian adolescents.

**Methods** A cross-sectional study was conducted in four secondary schools in Kuala Lumpur, Malaysia using a newly developed questionnaire which comprised of two main domains and seven items. Exploratory factor analysis and Cronbach's alpha were used to measure the instrument's construct validity and reliability.

**Results** A total of 106 adolescents participated in this research. The majority of adolescents were 13 years old (40.6%), female (55.7%), Malays (68.9%), have parents who only studied until secondary school (66.0%) and lived in flats (32.1%). Bartlett's Test of Sphericity was significant (Chi-square = 258.361,  $p < 0.001$ ) and Kaiser-Meyer-Olkin (KMO) value was 0.820. The final model of the instrument contained two domains, the neighbourhood physical environment and neighbourhood social environment factors. Factor loadings for all items were satisfactory ranging from 0.591 to 0.870. The overall Cronbach's alpha was 0.810.

**Conclusions** The Neighbourhood Factors on Mental Health Questionnaire was found to be a valid and reliable instrument. It can be used to assess neighbourhood physical and social factors that can influence mental health of adolescents in Malaysia.

**Keywords** Neighbourhood - validity - physical - social - environment.

## INTRODUCTION

Mental health is found to be one of the leading factors of health-related disability among children and adolescents but this issue is still not given top priority, especially in low-income and middle-income countries<sup>1</sup>. The risk factors associated with mental health among adolescents are usually described by researchers at an individual level, which includes factors like stress at school,<sup>2</sup> parental divorce,<sup>3</sup> family socioeconomic status<sup>4</sup> and parental violence.<sup>5</sup>

However, neighbourhood factors and health have opened a new insight into the field of epidemiology. For example, presence of well-maintained recreational parks in a neighbourhood<sup>6</sup> have been shown to be protective against perceived stress among adolescents while noise pollution in an adolescent's neighbourhood was found to be associated with increased hyperactivity and emotional symptoms.<sup>7</sup> Safe and supportive physical and social environments are vital for children in their growing-up years. The condition of the children's neighbourhood is a factor that should be given much emphasis to ensure that they achieve good physical and mental well-being.<sup>8</sup>

Various tools have been used to collect data on neighbourhood factors in other researches. In Taiwan, a Neighbourhood Quality Index was used based on adaptations from previous studies and feedback from focus groups discussions. It is a 16-item questionnaire with a four point Likert style response scale. It covers domains such as neighbourhood experiences, security, community involvement, physical environment and social cohesion.<sup>9</sup> Another study in Canada used a 14-item questionnaire based on other studies to measure neighbourhood quality that comprised statements such as "my neighborhood is a good place to live" and "if I had to move out of this neighborhood, I would be sorry to leave".<sup>10</sup> Some studies have also taken questions related to neighbourhood factors from national census data<sup>11,12</sup> to be used in studying neighbourhood influences on mental health as the survey questions are readily available for usage by researchers from that particular country.

To determine the neighbourhood factors that influence mental health of adolescents in Malaysia, we intend to develop a questionnaire that is short and easy to understand by adolescents and tailored to the Malaysian population. The objective of this study was to assess reliability and validity of the Neighbourhood Factors on Mental Health Questionnaire among Malaysian adolescents.

## METHODS

A cross-sectional study was conducted in four secondary schools in Kuala Lumpur, Malaysia in January 2015 to February 2015. The inclusion criteria for this research were adolescents aged

between 13-16 years old and those who have been staying at the particular neighbourhood for at least one year. Purposive sampling was done to give a total final sample size of 106 adolescents.

### *Instrument*

The questionnaire was developed in Malay language. Extensive literature review and discussions were done for content validity. Questions in the domains were created based on input from a psychiatry specialist who identified externalizing and internalizing behaviours that can be associated with neighbourhood factors. The questionnaire was also reviewed by three Public Health specialists to incorporate important public health aspects into the instrument. The final version of the questionnaire after content validity assessment contained seven items that covered two main domains. The first domain is the neighbourhood physical environment factors that looked into noise and spacious environment in neighbourhood. The second domain is the neighbourhood social environment factors that looked into residents' association in neighbourhood and crime and safety in neighbourhood.

Noise and spacious environment in neighbourhood contained three items which are "Is your neighbourhood not too noisy?", "Does your neighbourhood only gets noisy during festive seasons? (Eg: Hari Raya Puasa, Chinese New Year or weddings)" and "Does your neighbourhood have a spacious environment?". Residents' association in neighbourhood contained two items which are "Does your neighbourhood have any residents' association (Eg: Rukun tetangga, residents' committee)?" and "If available, is the residents' association in your neighbourhood running actively?". Lastly, crime and safety in neighbourhood contained two items which are "Does your neighbourhood have a good level of safety measures against crime?" and "Can you play safely in your neighbourhood, particularly areas surrounding your house?". The responses for each item were measured using 5-point Likert scale; score 1: Totally disagree (sangat tidak setuju), score 2: Disagree (tidak setuju), score 3: Not sure (tidak pasti), score 4: Agree (setuju) and score 5: Totally agree (sangat setuju).

### *Statistical analysis*

All data were entered and analyzed using SPSS software Version 20.0. Respondents' sociodemographic data were analyzed using descriptive statistics. Internal consistency reliability of the questionnaire was measured by using Cronbach's alpha.<sup>13</sup> A Cronbach's alpha of 0.70 to 0.9 is considered as acceptable evidence of internal consistency. A high value of > 0.9 is considered redundant.<sup>14</sup>

Exploratory factor analysis was performed for construct validity. Rotation method chosen was the Varimax rotation method and all factors with Eigenvalue greater than 1.0 were selected. The value of Kaiser-Meyer-Olkin of more than 0.6 and Bartlett's test of Sphericity ( $p < 0.05$ ) indicate that the model is adequate. Items with factor loading of more than 0.4 was considered to be acceptable<sup>15</sup>.

#### Ethical consideration

This research was approved by the Universiti Kebangsaan Malaysia Research Ethics Committee

(UKMREC) (UKMREC approval number UKM 1.5.3.5/244/FF-2014-426).

## RESULTS

A total of 106 adolescents participated in this study. The majority of adolescents were 13 years old (40.6%), female (55.7%), Malays (68.9%), have parents who only studied until secondary school (66.0%) and lived in flats (32.1%) (Table 1).

**Table 1** Sociodemographic characteristics of adolescents

Variable (n=106)	f	%	Mean ( $\pm$ SD)
<b>Age</b>			14.18 $\pm$ 1.26
13 years old	43	40.6	
14 years old	32	30.2	
15 years old	1	0.9	
16 years old	29	27.4	
17 years old	1	0.9	
<b>Gender</b>			
Male	47	44.3	
Female	59	55.7	
<b>Ethnicity</b>			
Malay	73	68.9	
Chinese	25	23.6	
Indian	5	4.7	
Others	3	2.8	
<b>Parents' education</b>			
Primary school	10	9.4	
Secondary school	70	66.0	
Diploma	11	10.4	
Degree	9	8.5	
Masters	6	5.7	
<b>Type of house</b>			
Rented room	1	0.9	
Flat	34	32.1	
Apartment	17	16.0	
Condominium	9	8.5	
Single storey terrace	15	14.2	
Double storey terrace	14	13.2	
Bungalow	3	2.8	
Others	13	12.3	

Construct validity results through exploratory factor analysis revealed significant Bartlett's Test of Sphericity (Chi-square = 258.361,  $p < 0.001$ ) and Kaiser-Meyer-Olkin (KMO) of 0.820. The items were divided into two domains based on Eigenvalue greater than 1. Three items were loaded into the first domain and four items were loaded into the second domain. The first domain is the physical environment factors in the neighbourhood that consists of three questions

which were "Is your neighbourhood not too noisy?", "Does your neighbourhood only gets noisy during festive seasons? (Eg: Hari Raya Puasa, Chinese New Year or weddings)" and "Does your neighbourhood have a spacious environment?". Factor loadings for this domain for each item were satisfactory ranging from 0.608 to 0.849. The second domain is the social environment factors in the neighbourhood that consists of four questions which were "Does your neighbourhood have any

## Validity, Neighbourhood Mental Health Questionnaire

residents' association (Eg : Rukun tetangga, residents' committee)?", "If available, is the residents' association in your neighbourhood running actively?", "Does your neighbourhood have a good level of safety measures against crime?" and "Can you play safely in your

neighbourhood, particularly areas surrounding your house?". Factor loadings for this domain for each item were satisfactory ranging from 0.591 to 0.870. Therefore, this model was considered as the final model (Table 2). No items were removed or added to get the final model.

**Table 2** Exploratory Factor Analysis of Neighbourhood Factors on Mental Health Questionnaire (Final Model)

Questions	Factor	
	1	2
<b>Domain 1: Physical environment factors</b>		
Is your neighbourhood not too noisy?	0.849	
Does your neighbourhood only gets noisy during festive seasons? (Eg: Hari Raya Puasa/Chinese New Year/weddings)	0.810	
Does your neighbourhood have a spacious environment?	0.608	
<b>Domain 2: Social environment factors</b>		
Does your neighbourhood have any residents' association (Eg : Rukun tetangga, residents' committee)?		0.870
If available, is the residents' association in your neighbourhood running actively?		0.860
Does your neighbourhood have a good level of safety measures against crime?		0.607
Can you play safely in your neighbourhood, particularly areas surrounding your house?		0.591

Note: Cumulative variance explained (2 factors) = 67.77%, Bartlett's Test of Sphericity (Chi-square = 258.361,  $p < 0.001$ ) and KMO = 0.820

For the questionnaire reliability analysis, the final model Cronbach's alpha for total and individual domains were satisfactory. The overall

value for Cronbach's alpha was 0.810. Cronbach's alpha value for the first domain was 0.715 and the second domain was 0.805 (Table 3).

**Table 3** Reliability Analysis of Neighbourhood Factors on Mental Health Questionnaire (Final Model)

Domain	Cronbach's alpha
<b>Domain 1: (no. of items = 3)</b>	
Physical environment factors	0.715
<b>Domain 2: (no. of items = 4)</b>	
Social environment factors	0.805
Total	0.810

## DISCUSSION

We have successfully developed a new valid and reliable questionnaire aimed to be used to study neighbourhood factors that can influence mental health of adolescents in Malaysia. The final model of this questionnaire consists of two main domains which are the neighbourhood physical environment factors and the neighbourhood social environment factors. This is consistent with other studies that also divide the neighbourhood factors into these two major domains. For example, in the United Kingdom, researchers looked into perceived physical and social environment characteristics and found that social support was important for mental health.<sup>16</sup> Another study in Australia found that physical and social factors in a neighbourhood both contributed significantly to a better mental health.

This is due to presence of green spaces that provided residents a place to walk, exercise and form good social interactions<sup>17</sup>. Other studies have also divided the neighbourhood factors into physical and social factors to study its effect on physical health.<sup>18,19</sup>

To date, there are currently no other specific instruments used by researchers in Malaysia to study influence of neighbourhood factors towards adolescents' mental health. The Malaysian National Health and Morbidity Survey is a nationwide census carried out to provide health related community base data and information for the usage of the Ministry of Health Malaysia in reviewing its health priorities, programme strategies, activities and planning its allocation of resources. Data regarding housing conditions are

asked in the survey but questions pertaining to neighbourhood and its associated environmental factors are not covered.<sup>20</sup>

In other countries, instruments used to study neighbourhood influences on health have been shown to be valid and reliable, consistent with findings from our research. In Taiwan, a Neighbourhood Quality Index Questionnaire that covers physical and social factors revealed a Cronbach's alpha of between 0.67 to 0.84. Factor loadings ranged between 0.47 to 0.79. This particular tool can be used to measure individual mental and physical health.<sup>9</sup> Other instruments that measure neighbourhood physical and social environment factors but focusing more on its effects on physical health were also noted to have a good validity and reliability. In Germany, a questionnaire used to assess influence of social support and physical environment on adolescents gave an acceptable Cronbach's alpha value and factor loadings that ranged between 0.62 to 0.87<sup>21</sup> while in Sri Lanka, the Physical and Social Environment Scale (PASES) showed satisfactory Cronbach's alpha and factor loadings that lie between 0.47 to 0.87.<sup>22</sup>

In this study, the overall Cronbach's alpha value was 0.810. This value is considered good as the value is between 0.7 to 0.9. High values of Cronbach's alpha that is more than 0.9 may be due to duplication of content across items and can result in redundancy.<sup>23</sup> Exploratory factor analysis results gave factor loading values in two main domains that ranged between 0.591 to 0.870. This fulfills the requirement that a domain should contain at least three to five items with significant loadings before it can only be considered as a stable domain.<sup>24</sup>

There are some limitations to this study. First, items for neighbourhood facilities were not included in the Likert scale type questions but that information was gathered separately by asking the adolescents to choose facilities available in their neighbourhood from a given list. Therefore, analysis of validity and reliability of neighbourhood facilities were not measured. Next, adolescents who answered the neighbourhood questionnaire might be subjected to information bias as the reasoning behind them giving the scores can be subjective from one person to another. Recommendations for future studies would include conducting a confirmatory factor analysis to confirm the two main domains identified from this research and to do a cross validation of this questionnaire in a different population, for example in a rural population, to ensure that it can be utilized in other settings.

## CONCLUSION

The Neighbourhood Factors on Mental Health Questionnaire was found to be a valid and reliable

instrument. It can be used to assess neighbourhood physical and social factors that can influence mental health of adolescents in Malaysia. Further confirmatory factor analysis may be done to confirm the final model.

## ACKNOWLEDGMENT

We would like to express our utmost appreciation to the Ministry of Education, Malaysia and Kuala Lumpur Federal Territory Education Department for approving our plan to conduct this research and to the UKMMC Fundamental Research Fund for providing grant to this research. We also would like to extend our gratitude to all the headmasters, teachers, parents and adolescents who took part in this study.

## REFERENCES

1. Kieling C, Baker-Henningham H, Belfer M, Conti G, Ertem I, Omigbodun O, Rohde LA, et al. Child and adolescent mental health worldwide: evidence for action. *Lancet*. 2011; 378(9801): 1515–25. doi:10.1016/S0140-6736(11)60827-1.
2. Shahmohammadi N. Students' coping with stress at high school level particularly at 11th & 12th grade. *Procedia - Social and Behavioral Sciences*. 2011; 30: 395–401. doi:10.1016/j.sbspro.2011.10.078.
3. Størksen I, Røysamb E, Moum T, Tambs K. Adolescents with a childhood experience of parental divorce: A longitudinal study of mental health and adjustment. *Journal of Adolescence*. 2005; 28(6): 725–39. doi:10.1016/j.adolescence.2005.01.001.
4. Paananen R, Ristikari T, Merikukka M, Gissler M. Social determinants of mental health: a Finnish nationwide follow-up study on mental disorders. *Journal of epidemiology and community health*. 2013; 1–7. doi:10.1136/jech-2013-202768.
5. Greenfield E, Marks NF. Identifying experiences of physical and psychological violence in childhood that jeopardize mental health in adulthood. *Child Abuse & Neglect*. 2010; 34(3): 161–71. doi:10.1016/j.chiabu.2009.08.012.
6. Feda DM, Seelbinder A, Baek S, Raja S, Yin L, Roemmich JN. Neighbourhood parks and reduction in stress among adolescents: results from Buffalo, New York. *Indoor and Built Environment*. 2014; 24(5): 631–639. doi:10.1177/1420326X14535791.
7. Tiesler CMT, Birk M, Thiering E, Kohlböck G, Koletzko S, Bauer CP, Berdel D, et al. Exposure to road traffic noise and children's behavioural problems

- and sleep disturbance: Results from the GINIplus and LISApplus studies. *Environmental Research*. 2013; 123: 1–8. doi:10.1016/j.envres.2013.01.009.
8. Center on the Developing Child at Harvard University. The Foundations of Lifelong Health Are Built in Early Childhood. 2010. Retrieved from <http://www.developingchild.harvard.edu>.
  9. Yang MJ, Yang MS, Shih CH, Kawachi I. Development and validation of an instrument to measure perceived neighbourhood quality in Taiwan. *J Epidemiol Community Health*. 2002; 56: 492–496.
  10. Schaefer-McDaniel N. Neighborhood stressors, perceived neighborhood quality, and child mental health in New York City. *Health Place*. 2009; 15(1): 148-155.
  11. Xue Y, Leventhal T, Brooks-Gunn J, Earls FJ. Neighborhood residence and mental health problems of 5- to 11-year-olds. *Arch Gen Psychiatry*. 2005; 62: 554-563.
  12. Butler A, Kowalkowski M, Jones H, Raphael J. The Relationship of Reported Neighborhood Conditions With Child Mental Health. *Academic Pediatrics*. 2012; 12(6): 523-531.
  13. Sun W, Chou CP, Stacy AW, Huiyan MA, Unger J, Gallaher P. SAS and SPSS macros to calculate standardized Cronbach's alpha using the upper bound of the phi coefficient for dichotomous items. *Behavior Research Methods*. 2007; 39(1): 71-81.
  14. Tavakol M, Dennick R. Making sense of Cronbach's alpha. *International Journal of Medical Education*. 2011; 2: 53-55. DOI: 10.5116/ijme.4dfb.8dfd.
  15. Hooper D. *Exploratory Factor Analysis. Approaches to Quantitative Research – Theory and its Practical Application: A Guide to Dissertation Students*, Cork, Ireland. Oak Tree Press. 2012.
  16. Gidlow C, Cochrane T, Davey RC, Smith G, Fairburn J. Relative importance of physical and social aspects of perceived neighbourhood environment for self-reported health. *Preventive Medicine*. 2010; 51: 157–163.
  17. Sugiyama T, Leslie E, Giles-Corti B, Owen N. Associations of neighbourhood greenness with physical and mental health: do walking, social coherence and local social interaction explain the relationships?. *J Epidemiol Community Health*. 2008; 62: e9. doi:10.1136/jech.2007.064287.
  18. Gose M, Plachta-Danielzik S, Willié B, Johannsen M, Landsberg B, Müller MJ. Longitudinal Influences of Neighbourhood Built and Social Environment on Children's Weight Status. *Int. J. Environ. Res. Public Health*. 2013; 10: 5083-5096. doi:10.3390/ijerph10105083.
  19. van Loon J, Frank LD, Nettlefold L, Naylor PJ. Youth physical activity and the neighbourhood environment: Examining correlates and the role of neighbourhood definition. *Social Science & Medicine*. 2014; 104: 107-115.
  20. Ministry of Health Malaysia. *National Health and Morbidity Survey IV (NHMS IV)*. 2011.
  21. Reimers AK, Jekauc D, Mess F, Mewes N, Woll A. Validity and reliability of a self-report instrument to assess social support and physical environmental correlates of physical activity in adolescents. *BMC Public Health*. 2012; 12: 705.
  22. SHDS Weliange, Fernando D, Gunatilake J. Development and validation of a tool to assess the physical and social environment associated with physical activity among adults in Sri Lanka. *BMC Public Health*. 2014; 14: 423.
  23. Panayides P. Coefficient Alpha Interpret With Caution. *Europe's Journal of Psychology*. 2013; 9(4). doi:10.5964/ejop.v9i4.653.
  24. Beavers AS, Lounsbury JW, Richards JK, Huck SW, Skolits GJ, Esquivel SL. *Practical Considerations for Using Exploratory Factor Analysis in Educational Research*. Practical Assessment, Research & Evaluation. 2013; 18(6).