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Living environment and psychological distress in the general population of Hong Kong

Corine SM Wong^a, WC Chan^{a,*}, Linda CW Lam^b, WY Law^b, WY Tang^b, TY Wong^b,
Eric YH Chen^a

^a*Department of Psychiatry, The University of Hong Kong, Hong Kong SAR, China*

^b*Department of Psychiatry, The Chinese University of Hong Kong, Hong Kong SAR, China*

Abstract

Hong Kong is well known for its high-rise and high-density housing where living conditions are inevitably linked to psychological distress. Understanding environmental factors at household- and neighbourhood-level is essential for future urban planning. The present study examines the association between built environment, housing and neighbourhood quality and psychological distress in a sample of 702 participants recruited from the longitudinal study of Hong Kong Mental Morbidity Survey (HKMMS). Participants with significant psychological distress perceived poorer quality of household and neighbourhood environments in various domains. Smaller household size and older property were also associated with increased risk of psychological distress, after controlling for other potential confounders. The data shed light on the importance of urban environment in the ecological model of mental health.

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1. Introduction

Population living in urban areas, especially in the more developed countries, has been growing tremendously in the recent centuries¹. Living environment has been considered as one of the key determinant of population health,

* Corresponding author. Tel.: +852-22555303; fax: +852-28551345.

E-mail address: waicchan@hku.hk

both physical and mental²⁻⁴. Previous evidences showed that living environment built with better-qualified or destination-driven facilities were associated with better general health, increased physical activity level, lower obesity, less reported of depression and alcohol abuse⁵⁻⁷. Not only does living environment has a significant impact on adults, it also affects physical and cognitive development in children⁸, as well as the quality of life, functioning and longevity in older people^{9, 10}. While majority of past studies examining the relationship between living environment and health have focused predominantly on physical health, there is an increasing emphasis on its effects on mental health^{11, 12}.

In Hong Kong, environmental studies regarding mental health have been mainly focused on children¹³, adolescents¹⁴, and older people^{15, 16}. There is insufficient evidence to address the impact of living environment on mental health among the general population. The present study, therefore, aims to examine the links between built environment, housing and neighbourhood quality and psychological distress using general population data, while controlling for socio-demographic and economic factors. We hypothesized that significant psychological distress would be associated with poorer perceptions of environmental characteristics. Also, satisfaction with the quality of household and neighbourhood environments would be negatively associated with the level of psychological distress.

2. Methods

2.1. Study design and participants

Hong Kong Mental Morbidity Survey (HKMMS) is the first territory-wide psychiatric epidemiological study in Hong Kong. At baseline interview, community data were collected through face-to-face interviews of 5,719 non-institutionalized individuals aged 16-75 from November 2010 to May 2013. Eligible participants were interviewed by trained research assistants using rater-administered instruments. The overall participation rate was 68%. Detailed methods of recruitment have been described elsewhere¹⁷. Three years after the baseline assessment, 1,040 participants were randomly selected and invited to participate the follow-up study. To examine living environment, the interviews were carried out in participants' homes and each assessment lasts for about 60-90 minutes. The present paper reported the preliminary results of the first 702 participants recruited. The study was approved by the Clinical Research Ethics Committees of the University of Hong Kong and the Chinese University of Hong Kong. Written informed consent was obtained from all participants.

2.2. Assessments

Sociodemographic information including age, gender, education attainment, marital and employment status, personal and household income, financial subsidy and difficulty were collected. Information about the living environment, such as property age, housing type, floor level, household size, and housing tenure status, were collected using standardized structured inventory. Perceived environmental quality of the household and neighbourhood was measured. Items were rated on a 5-point Likert scale ranging from 1 (strongly dissatisfied) to 5 (strongly satisfied). Total score (on household and neighbourhood separately) were summed to yield an overall satisfaction score of 10-50, which higher score indicating higher level of satisfaction on the living environment.

Level of psychological distress in past one week was measured by the Chinese version of Revised Clinical Interview Schedule (CIS-R)¹⁸. The scale consists of 14 sections covering various psychological symptoms. The Chinese version has been validated with satisfactory psychometric properties, and a cut-off point of 12 was considered to have significant psychological distress¹⁹.

2.3. Statistical analyses

Statistical analyses were performed using STATA version 12.0 (StataCorp, College Station, TX)²⁰. Independent sample t-tests and chi-square tests, adjusted for potential confounding factors, were used to compare group difference between the healthy individuals and those with significant psychological distress. Logistics regression models were used to examine the association of built environment, perceived environmental quality and the psychological distress.

Crude and adjusted odds ratios (OR) and their 95% confidence intervals were calculated. Statistical significance was set at two-sided $p < 0.05$ for all tests.

3. Findings

3.1. Sociodemographic characteristics of the study sample

A total of 702 participants were recruited from November 2014 to February 2016. The mean age and education level of the sample were 46.0 (SD 15.1) and 13.3 (SD 5.6), respectively. Around 60% were females. 40% of the participants living in public housing and 60% were in private housing. The mean household size was 523.2 square feet (SD 299.1, range 80-2500), and the mean property age was 22.3 (SD 5.9). Of all, 501 (71.4%) and 201 (28.6%) had CIS-R scores of 0-11 and ≥ 12 , representing the healthy individuals and those with significant psychological distress.

3.2. Perceived environmental quality and psychological distress

At the household-level, participants with significant psychological distress perceived poorer household quality in hygiene, personal spacing, toilet facilities, and architectural design (all $p < .05$) comparing to the healthy group. At the neighbourhood-level, they perceived poorer quality in hygiene, shopping and catering convenience, park and recreation, and neighbourhood safety (all $p < .05$) (Fig 1). In multivariate regression model, higher satisfaction with the neighbourhood environments decreased the risk of psychological distress (OR 0.87, 95% CI 0.79-0.96). No significant association was found between the overall satisfaction of housing and psychological distress (Table 2).

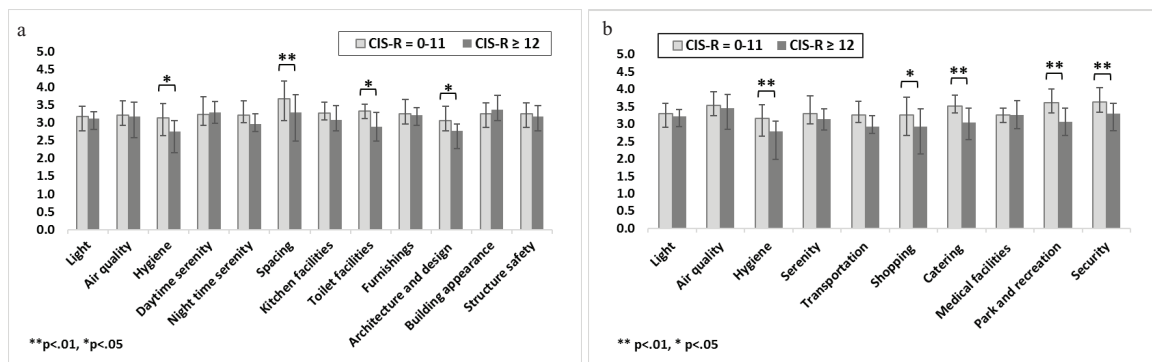


Fig. 1. Comparing healthy individuals and participants with psychological distress in perceived (a) housing quality; (b) neighbourhood quality.

Table 2. Association between built environment, perceived environmental quality and psychological distress.

	Crude OR (95% CI) ^a	Adjusted OR (95% CI) ^b
Perceived housing quality	0.93 (0.86-1.01)	0.92 (0.84-1.00)
Perceived neighbourhood quality	0.85 (0.78-0.94)***	0.87 (0.79-0.96)**
Housing type (private housing as ref.)	0.72 (0.38-1.38)	0.82 (0.42-1.61)
Household size (largest quantile as ref.)	1.89 (1.69-2.55)***	1.36 (1.08-1.87)*
Property age	1.11 (1.04-1.18)***	1.10 (1.04-1.17)**
Housing tenure status (tenured as ref.)	1.23 (0.64-2.38)	1.11 (0.56-2.18)

OR, odds ratio; CI, confidence interval. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^a Univariate regression model.

^b Multivariate regression model adjusted for other sociodemographic variables.

3.3. Built environment and psychological distress

Smaller household size (OR 1.36, 95% CI 1.08-1.87) and older property (OR 1.10, 95% CI 1.04-1.17) were associated with increased odds of psychological distress, after controlling for other potential confounding factors, including age and household income that might be correlated with both built environment and psychological distress (Table 2).

4. Conclusions

The present study reported the first-ever evidence on the relationship between living environment and psychological distress among the general population of Hong Kong. Perceptions of environmental characteristics, especially the living neighbourhood, have significant impact on mental health. Built environment such as household size and property age are also shown to be important contributors. Due to the cross-sectional nature of the analysis, causal inferences could not be drawn. Future research should utilize the baseline data and examine the extent to which the living environment affects mental health over time.

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