International Journal of Environmental Health Research, 2013
Vol. 23, No. 1, 31–45, http://dx.doi.org/10.1080/09603123.2012.684148

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Implications of perceived physical and social aspects of the environment for self-reported physical and mental health

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(*Received 9 December 2011; final version received 18 March 2012*)

The purpose of the present study is to explore the relative importance of certain socio-demographic variables, perceived physical and social attributes of the home and neighborhood for self-reported physical and mental health. The sample of the present study comprised 137 men and women (51.83% women and 48.17% men) ranging in age from 26 to 54 years selected randomly from shoppers visiting a crowded shopping plaza. A sociodemographic data sheet, scales to measure perceptions of the physical environment and neighborhood characteristics, and the SF-36 to assess physical and mental health components were used. Data were analyzed using multivariate analyses of variance, Pearson's correlation coefficients and multiple regression analysis. No age and gender differences in physical and mental health scores emerged ($p < 0.05$), but people who perceived their socio-economic status as low also reported lower total mental health scores ($p < 0.05$). No socioeconomic differences were noted on indices of physical health ($p > 0.05$). Correlation analysis revealed that negative perceptions of the interior home environment were associated negatively with physical and mental health scores ($p < 0.05$). Regression analysis indicated that perceived decay and disorganization in the home interior as well as perceived socioeconomic status accounted for a significant portion of the variance in mental health scores.

Keywords: environment; mental health; physical health; socioeconomic status; social support

Introduction

With increasing awareness that environmental factors can impact health, the investigation of the environment as an important determinant of health is an emergent area of interest. The social ecology model which has gained prominence in health promotion asserts that health is influenced by various facets of both the physical and social environment in addition to various personal attributes (Stokols 1992). This model recognizes the interwoven relationship that exists between the individual and their environment. While individuals are responsible for instituting and maintaining the lifestyle changes necessary to reduce risk and improve health, individual behavior is determined to a large extent by the physical environment (e.g. accessibility to stairs, sidewalks, public transport, and safe streets recreational facilities) and the social

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environment, (e.g. community norms and values, regulations, and policies). This notion that physical, social and mental well-being is the result of people's transactions with their physical and socio-cultural environments (Sallis et al. 1998) provides the rationale for research that explores the links between health and various attributes of the environment. As environments within which people interact on a daily basis, the home and the neighborhood can reasonably be expected to affect their health. One way to understand the role of these environments on any aspect of health is to consider the various components of these environments as perceived by the people exposed to them. That is, based on people's perceptions of the aspects of the physical environment, such as their home and neighborhood, it might be possible to understand the implications their experiences can have on their health.

The multiple spaces an individual relates within as well as the frequency and duration of their interactions can have differential effects on aspects of their health (Cummins et al. 2007). In keeping with the social ecology model, facets of the environment can be classified into physical (green space, connectivity to public transit, and retail establishments) and social characteristics (crime, trust, and reciprocity). There is some empirical evidence linking people's perceptions of their physical and social environment with their health. Previous studies have explored the health effects of exposure to green space (Maas et al. 2006; Mitchell and Popham 2007) and urban sprawl (Ewing et al. 2003). Other studies have supported the notion that aspects of the physical environment such as walkability (Giles-Corti et al. 2003) and availability of healthy food stores (Morland et al. 2006) are associated with obesity or may even be "obesogenic" (Booth et al. 2005; Lopez and Hynes 2006; Rundle et al. 2007). Some studies have reported that parental perception of the physical environment of the neighborhood as deteriorated (Timperio et al. 2005) or unsafe (Lumeng et al. 2006) is associated with child obesity risk. Perceived environmental factors and neighborhood satisfaction was found to be associated with self-reported general health (Poortinga et al. 2007) and mental health (Leslie and Cerin 2008).

Relationships between indoor building conditions and well-being of occupants have also been established (Apte et al. 2000; Bonnefoy et al. 2004). These studies have shown that many indoor stressors such as thermal factors, lighting aspects, noise and vibration cause their effects either additively or through complex interactions. More recently, studies have indicated that indoor building conditions may also be associated with mental health effects (Houtman et al. 2008), cancer and cardiovascular disease (Lewtas 2007), asthma (Fisk et al. 2007), obesity (Bonnefoy et al. 2004), and physical activity (Prochaska et al. 2002; Sallis and Glanz 2006). Psychological isolation or depression has also been found to appear in association with deterioration of the physical environment (Galea et al. 2005). However, an understanding of the mechanisms underlying the relationship between indoor environmental aspects and health is still limited.

Fullilove and Fullilove III (2000) have asserted that the association between housing and health can be explained along three dimensions. Housing can be considered as (1) satisfying a basic need (2) giving rise to the physical infrastructure of group life and (3) being the center of an individual's orientation in terms of time and space. Within this framework, the appearance of the physical environment may give rise to specific cognitions and emotions which regulate behaviors and, therefore, impact health. That is, aspects of the household environment and immediate surrounding may contribute to restricted physical activity, obesity, loneliness, and depression. In this theoretical framework, the association between deterioration of

the physical environment and health consequences is mediated by health-related behaviors which follow from an individual's appraisal of the physical and social aspects of the home and neighborhood. Besides the physical environment inside the home, the external environment can be associated with physical and psychological problems. Life in areas lacking in welfare facilities can expose the residents of that region to a lot of stress.

Research suggests that physical and mental health are also associated with socio-economic status (Wang and Zhang 2006; Lovasi et al. 2009). Socioeconomic status (SES) is a broad term that is used to describe factors about a person's lifestyle including occupation, income, and education. The association of socioeconomic variables with poor health status has been widely observed, if not well understood. In particular, studies (Margaretten et al. 2011) suggest that lower socio-economic status is linked to poorer health outcomes. Poor health may in turn decrease an individual's capacity to work, thus reducing their ability to improve their socio-economic status (Murray and Lopez 1997). Individuals from low socioeconomic classes are not only exposed to more stresses (Wilkinson and Pickett 2006) but also live in unfavorable physical environments (Gordon-Larsen et al. 2006; Powell et al 2006), making them vulnerable to physical and mental health problems.

Apart from the socioeconomic status and perceptions of the physical environment, the social environment has also been investigated as a potential support or deterrent for health behavior. The social environment is a multifaceted concept which has been used to refer to social support, social cohesion and even social capital (Almedom 2005; De Silva et al. 2005). The presence of a social support network is associated with better health. Help available to individuals from friends, family, co-workers and others within communities can provide a buffer against adverse life events and living conditions, and can provide a positive resource for enhancing quality of life (Nutbeam 1998). Being emotionally and mentally healthy means having an ability to bounce back from adversity, trauma, and stress. One of the key factors in resilience is having a strong support network. Having trusted people to turn to for encouragement and support will boost an individual's resilience in tough times (Smith et al. 2011).

Although the personal attributes, socioeconomic status and the environment have all been implicated in the health status of an individual, there is no consensus on how important the aspects of the physical environment are in the determination of the health status of individuals. The relative potential contributions of these sets of variables to the physical and mental well-being of residents are the focus of this study. The purpose of the present study is to explore the relative importance of certain socio-demographic variables, perceived physical and social attributes of the home and neighborhood for self-reported physical and mental health. Specifically, age, gender, perceived socio-economic status, perceived social support, perceived decay, deterioration, and disorganization of the home and neighborhood and their relationship with indices of physical and mental health have been explored.

Method

Participants

The sample of the present study comprises 137 men and women (51.83% women and 48.17% men) ranging in age from 26 to 54 years. Their mean age was 37.59 years (SD 8.17). These individuals were selected randomly from shoppers visiting a

crowded shopping plaza over a period of 30 days. Conveniently located in the heart of the city and easily accessible, this shopping plaza is the largest indoor shopping center in the city and offers a variety of shops under one roof which seem to cater to all walks of life. In order to maximize the probability of obtaining a truly random sample, a 5 pm to 8 pm time slot was selected and every seventh visitor to the mall during this time period was approached and invited to participate in the study. Sampling was carried out on 30 consecutive days, with four to five individuals being recruited on each day.

Materials

All questionnaires were administered after participants provided written consent.

Sociodemographic data sheet

The socio-demographic information collected included sex, age, marital status, occupational status, perceived socioeconomic status, employment status, educational level, and household tenure.

Perceived Physical Environment Scale

The items pertaining to this scale were selected from the checklist used in the Fragile Families and Child Wellbeing Study (Duarte et al. 2010). The interior physical environment was evaluated using eight items regarding the integrity and organization of the household. The assessment of the exterior physical environment was made using 11 items that addressed the conditions of the building and of the streets within 100 m of the household. To assess perceptions of the household interior physical environment, four items relating to household interior decay (broken or cracked windows, walls, ceiling or floor), and four to household interior disorganization (darkness, crowding, cluttering, and dirtiness) were used. As regards assessment of perceived exterior physical environment, four items pertaining to the surrounding area deterioration (e.g. graffiti and vacant or abandoned buildings on the household's block or within 100 m) and six items pertaining to the building deterioration (e.g. broken glass/toys in the environment immediately outside of the building, cracked/damaged walls in the exterior of the building) were used. The item pertaining to peeling paint on the exterior of the building was omitted as buildings in Iran are usually not painted on the outside, and the item addressing alcohol and drug paraphernalia was omitted due to socio-cultural restraints. While in the original study, trained interviewers completed an observation checklist to provide information about the interior and exterior surroundings of the household, in the present study the checklist was completed by the participants themselves. Test–retest reliability with 25 subjects and an interval of 3 weeks was found to be 0.86. High scores on this scale indicate negative perceptions.

Perceived neighborhood characteristics questionnaire

To assess perceptions of the neighborhood environment, items from the Environmental Module of the International Physical Activity Prevalence Study

questionnaire were administered (IPS 2002). The questionnaire was slightly modified in accordance with the characteristics typical of Iranian society. Out of the 17 questions in the original questionnaire, 2 were omitted as they pertained to bicycle riding, an activity engaged in usually only by children and adolescents, and the item pertaining to possession of motor vehicles was also omitted as it was irrelevant to the goals of the study. The item pertaining to residential density was omitted from this scale as a similar question was already added to the socio-demographic data sheet. The other items pertaining to access to destinations; infrastructures in the neighborhood, esthetic qualities, social environment, street connectivity, and neighborhood safety were retained. All questions had a four-point Likert response scale: strongly disagree; somewhat disagree; somewhat agree, and strongly agree, with high scores indicating positive perceptions.

Five questions were added to assess the perceived general quality of the neighborhood, three regarding safety and noise in the neighborhood and two used as proxies of social support: (1) How safe is your neighborhood? Responses were indicated as ''very unsafe'', ''unsafe'', ''neither'', ''safe'', and ''very safe''; (2) How much safety do you have from traffic, for example when crossing streets? Responses were indicated as ''very unsafe'', ''unsafe'', ''neither'', ''safe'', and ''very safe''; (3) How much does street noise of the place where you live bother you? Responses were indicated as ''not at all'', ''a little'', ''moderately'', ''a lot'', and ''very much''. (4) How often do you interact with neighbors? Responses were indicated as ''never'', ''rarely'', ''sometimes'', ''often'', ''very often''; (5) How much can you count on them to help you if you need their help? Responses indicated as ''not at all'', ''a little'', ''to some extent'', ''a lot'', ''very much''.

Translation and back-translation were used to develop the Persian versions of the Perceived Physical Environment Scale and the Perceived Neighborhood Characteristics Questionnaire. Fifty bilingual university students completed both versions of the questionnaires. All the items of the two questionnaires had a Kappa coefficient of >0.62. Next the questionnaire was pilot tested on a small sample of 30 individuals to ensure clarity of the items. Test–retest reliability with 25 subjects and an interval of 3 weeks was found to be 0.86 for the Perceived Physical Environment Scale and 0.82 for the Perceived Neighborhood Characteristics Questionnaire. The internal consistency of the latter was found to be 0.72.

SF-36

The SF-36 self-administered, 36-item questionnaire that measures health-related functions in eight domains: physical functioning (PF); role limitations due to physical problems (RP); bodily pain (BP); vitality (VT); general health perceptions (GH); social functioning (SF); role limitations due to emotional problems (RE), and emotional well-being (EW). These eight domains were hypothesized to be grouped into two health dimension scales, that is, physical (PF, RP, BP, and GH) and mental (SF, VT, RE, and EW). After summing the Likert-scaled items in the SF-36, each scale was then standardized so that it ranged from 0 (lowest level of functioning) to 100 (highest level) (Ware et al. 1993). The Persian version of the scale developed by Motamed et al. (2005) has been used widely in health surveys and the internal consistency for the eight scales using Cronbach's alpha has been reported to be 0.87.

Results

The results of descriptive analyses showed that about 80% of the sample aged between 26 and 40 years and nearly 20% aged between 41 and 55 years. The average age of the participants was 37.59 years (SD = 8.17). About 26% of the sample had not completed high school while nearly 14% of the participants had had some education beyond high school. A little over two-thirds (67.15%) of the sample reported living in apartments and the average tenure of residence reported by the sample was 9.26 years and the majority of the sample perceived both their socio-economic status (almost 60%) and the level of their neighborhood to be (nearly 52%) neither low nor high. All details regarding the socio-demographic characteristics of the sample are displayed in Table 1.

The percentage of people reporting negative perceptions of the home environment is displayed in Table 2. As can be seen from this table, regarding the interior of the home, fewer people (less than 7%) endorsed broken or cracked windows, cracked floors and dirty rooms, while broken plaster or peeling paint, and crowded or

Table 1. Descriptive characteristics of the study sample.

Variables	*n*	%
Sociodemographics		
Gender		
Male	66	48.17
Female	71	51.83
Age groups		
26–40	110	80.29
41–55	27	19.71
Mean age years (SD)	37.59 (8.17)	
Education levels		
Up to elementary school	16	11.68
Up to middle school	20	14.59
Up to high school	81	59.12
Above high school	19	13.87
Time of residence		
1–5 years	21	15.33
6–10 years	48	35.03
10–15 years	35	25.55
>15 years	33	24.09
Mean years of residence (SD)	9.26 (5.41)	
Type of housing		
Detached single-family housing (row house or apartments of 2–3 stories)	44	32.12
Apartments of 4–8 stories	87	63.50
Apartments of more than 8 stories	5	3.65
Perceived SES		
Low	19	13.87
Middle	83	60.58
High	35	25.55
Perceived level of neighborhood		
Low	21	15.33
Middle	71	51.82
High	45	32.85

cluttered rooms were reported by more than 30% of the respondents. As regards the exterior of the home, vacant or abandoned buildings and broken glass or toys in the area surrounding the home were reported by a very small percentage (less than 3%) of the sample, but damaged exterior walls, large ditches and deteriorating buildings around the home were reported by a substantial percentage (40–60%) of the sample.

Perceived characteristics of the neighborhood are depicted in Table 3. It appears that a very small percentage (less than 10%) of the sample find their neighborhood unsafe. More than half the samples attribute positive qualities to their neighborhoods in terms of safety, access to public transportation ad shops. However, a lot of people (about 50%) appear to be bothered by the traffic. Furthermore, although the majority of the respondents reported limited interaction with their neighbors, a substantial percentage (more than 75%) counts on their neighbors for support.

Health scores of the sample are shown in Table 4. Considering that the scores on each of the subscales of the SF-36 range from 0 to 100, it can be seen that the mean scores of the sample on all the scales reflecting indices of health except the subscale denoting physical functioning are above 50.

To determine age, gender and social class differences in health scores, multivariate analyses followed by *post hoc* analysis (Bonferroni) were run. No age and gender differences in physical and mental health scores emerged ($p < 0.05$), but people who perceived their socio-economic status as low also reported greater limitations due to emotional problems, and lower scores on vitality, mental well-

Table 2. Percentage of the sample reporting negative perceptions of home environment.

	n	%
Perceived home environment characteristics		
Home interior		
Decay		
Broken windows/cracked window panes	9	6.57
Open cracks/holes in wall	25	18.25
Cracks/Holes on the floor	8	5.84
Broken plaster/peeling paint	47	34.31
Disorganization		
Darkness	41	29.93
Crowded	52	37.95
Cluttered rooms	64	46.71
Dirty rooms	8	5.84
Home exterior		
Surrounding area deterioration		
Garbage, litter/in the street/yard/sidewalk	23	16.79
General condition of buildings bad	60	43.79
Graffiti	26	18.97
Vacant or abandoned buildings	4	2.92
Environment immediately outside the house		
Broken steps	46	33.57
Broken glass/toys	4	2.92
Large ditches	85	62.04
Strewn garbage	23	16.79
Exterior of the building has		
Cracked or damaged walls	71	51.82
Broken/cracked windows	7	5.11

Table 3. Percentage of the sample reporting the perceived characteristics of the neighborhood.

	n	%
Perceived neighborhood characteristics		
Many shops are in walking distance of my home	80	58.34
Public transport is available within 10 min walk from my home	91	66.42
There are sidewalks on most streets in my neighborhood	63	45.98
My neighborhood has a low-cost gym or swimming pool	52	37.95
The crime rate in my neighborhood makes it unsafe to go for walks at night	9	6.57
There is so much traffic or crowd on the streets that it makes it difficult or unpleasant to walk	67	48.90
I see many people physically active in my neighborhood	92	67.15
There are many interesting things to look at while walking in my neighborhood	67	48.90
There are many four-way intersections in my neighborhood	76	55.47
The sidewalks are well maintained and not obstructed	40	29.20
There are many places to go within walking distance of my house	26	18.98
The crime rate in my neighborhood makes it unsafe to go for walks during the day	0	0
There is good park or green space in my neighborhood	21	15.33
Perceived quality of neighborhood		
Safety of neighborhood		
"very unsafe", "unsafe", "neither"	13	9.49
"safe", and "very safe"	124	90.51
Safety from traffic		
"very unsafe", "unsafe", "neither"	92	67.15
"safe", and "very safe"	45	32.85
Bothered by noise		
"not at all", "a little", "moderately"	73	53.28
"a lot", and "very much"	64	46.71
Social support		
Interaction with neighbors		
"never", "rarely", "sometimes"	79	57.66
"often", "very often"	58	42.33
Counting on neighbors		
not at all", "a little", "to some extent"	32	23.36
"a lot", "very much"	105	76.64

being, social functioning and total mental health scores ($p < 0.05$). No socio-economic differences were noted on indices of physical health ($p > 0.05$).

To examine the associations of perceived attributes of the household environment and the neighborhood with health indices, the obtained data were analyzed using Pearson's correlation coefficient and multiple regression analysis. Correlation analysis revealed that general health scores correlated negatively with negative perceptions of the interior home environment (-0.37, $p < 0.05$). Negative perceptions of the interior of the home, including perceptions of decay and disorganization were associated negatively with indices of vitality, emotional well-being, social functioning, bodily pain, general health and total physical and mental health scores ($p < 0.05$; see Table 5). Negative characteristics pertaining to the exterior of the home (including deterioration of the building and the surrounding area) were not found to be significantly associated with any of the indices of health ($p > 0.05$). Apart from the characteristics of the internal physical environment,

Table 4. Health scores grouped by perceived socio-economic status.

Scales	Perceived socio-economic status	Mean	Std. deviation	Scales	Perceived socio-economic status	Mean	Std. deviation
Physical functioning (PF)	High	53.58	31.18	Role limitations due to emotional problems (RE)	High	78.79	37.33
	Middle	46.07	26.42		Middle	47.56	37.18
	Low	39.67	32.39		Low	33.33	42.16
	Total	46.96	27.89		Total	52.73	39.81
Role limitations due to physical health (RP)	High	65.91	35.83	Vitality (VT)	High	62.73	29.27
	Middle	50.82	32.66		Middle	66.51	22.48
	Low	54.17	45.87		Low	37.50	17.82
	Total	54.54	34.81		Total	62.20	24.99
Bodily pain (BP)	High	60.00	33.85	Emotional well-being (EW)	High	67.27	27.00
	Middle	64.94	29.35		Middle	63.15	24.81
	Low	60.83	41.37		Low	35.33	21.97
	Total	63.36	31.24		Total	60.72	26.32
General health (GH)	High	61.36	25.40	Social functioning (SF)	High	82.95	17.92
	Middle	66.82	17.13		Middle	68.56	25.60
	Low	54.17	29.05		Low	43.75	23.38
	Total	64.10	20.69		Total	68.75	25.91
Total physical health	High	240.85	106.27	Total mental health	High	291.74	84.65
	Middle	228.66	68.16		Middle	245.79	89.55
	Low	208.83	110.77		Low	149.92	80.79
	Total	228.96	81.69		Total	244.40	94.67

Table 5. Correlations between home and neighborhood perceptions and indices of health.

	PF	RP	RE	VT	EW	SF	BP	GH	PH	MH
Home interior	−0.06	−0.22	−0.19	−0.38**	−0.39**	−0.46**	−0.44**	−0.37**	0.38**	0.41**
Decay	−0.18	−0.17	−0.26	−0.34*	−0.39**	−0.47**	−0.37**	−0.38**	0.37**	0.44**
Disorganization	−0.07	−0.23	−0.08	−0.34*	−0.31*	−0.37**	−0.42**	−0.30*	0.31*	0.31*
Home exterior	−0.06	−0.23	−0.11	−0.19	−0.11	−0.09	−0.16	0.01	−0.14	−0.01
Surrounding area deterioration	−0.03	−0.25	−0.06	−0.14	−0.13	−0.01	−0.25	−0.02	−0.22	−0.04
Building deterioration	−0.09	−0.18	−0.12	−0.19	−0.09	0.12	−0.09	−0.01	−0.08	0.00
Neighborhood	0.24	−0.05	−0.16	−0.06	−0.08	−0.13	−0.03	0.28*	−0.02	−0.01
Social support	0.12	0.09	0.18	0.38**	0.41**	0.29*	0.11	0.16	0.22	0.39**

PF = physical functioning; RP = role limitations due to physical health; RE = role limitations due to emotional problems; VT = vitality; EW = emotional well-being; SF = social functioning; BP = bodily pain; GH = general health; PH = physical health MH = mental health. *$p < .05$; **$p < .01$.

perceptions of the neighborhood were also related to general health ($r = 0.28$, $p < 0.05$), but not to any other indices of physical and mental health ($p > 0.05$). Perceived social support was found to be associated with total mental health scores as well as the indices of vitality, emotional well-being and social functioning ($p < 0.05$).

Finally, the relative contributions of perceptions of the internal physical environment, perceived social support as well as perceived socio-economic status in the prediction of physical and mental health were assessed using multiple regression analyses. Perceived decay of the internal physical environment ($\beta = -0.37$, $t(136) = 2.78$, $p < 0.05$) and perceived disorganization in the internal physical environment ($\beta = -0.30$, $t(136) = 2.26$, $p < 0.05$) significantly predicted physical health scores. Perceived decay of the internal physical environment and perceived disorganization in the internal physical environment also explained a significant proportion of variance in physical health scores, $R^2 = 13.8$, $F(1, 136) = 7.71$, $p < 0.05$, and $\Delta R^2 = 5.4$, $F(1, 135) = 3.22$, $p < 0.05$, respectively. Perceptions of social support and perceived socio-economic status failed to contribute to the prediction of physical health. On the other hand, findings indicated that mental health scores were predicted by perceived decay of the internal physical environment ($\beta = -0.43$, $t(136) = 3.36$, $p < 0.05$), perceived disorganization in the internal physical environment ($\beta = -0.16$, $t(135) = 2.40$, $p < 0.05$), perceived socio-economic status ($\beta = -0.35$, $t(136) = 2.66$, $p < 0.05$) as well as perceived social support ($\beta = -0.27$, $t(136) = 2.41$, $p < 0.05$). Therefore, significant proportions of variance in mental health scores were explained by perceived decay of internal environment ($R^2 = 17.3$, $F(1, 136) = 11.27$, $p < 0.05$), perceived disorganization in the internal environment ($\Delta R^2 = 2.4$, $F(1, 135) = 4.23$, $p < 0.05$), perceived socio-economic status ($\Delta R^2 = 10.7$, $F(1, 133) = 7.06$, $p < 0.05$) and perceived social support ($\Delta R^2 = 3.7$, $F(1, 133) = 5.32$, $p < 0.05$)

Discussion

The purpose of the study was to study the relationship of certain personal attributes (age and sex), perceived socioeconomic status, perceived social support, perceived characteristics of the internal and external physical environment and neighborhood with indices of physical and mental health. While the demographic variables of age and sex were not found to be associated with any of the indices of physical and mental health, perceived socioeconomic level and perceived social support were associated with mental health scores. Perceived characteristics of the home interior (decay and disorganization) were found to be associated with certain indices of both mental health (vitality, mental well-being, and social functioning) and physical health (bodily pain and general health) experienced by the residents. Perceived characteristics of the home exterior (surrounding area deterioration and building deterioration) were not related to indices of physical and mental health. Perceptions of the neighborhood were found to be associated only with reports of general health, one of the indices of physical health. Of these variables, only perceptions of socioeconomic status, social support and decay and disorganization of the home interior contributed to mental health, while only perceived decay and disorganization of the internal physical environment contributed to physical health.

The present study explored the associations between perceptions of the physical environment and health. Most previous studies (Bonnefoy et al. 2004; Li et al. 2005;

Clarke et al. 2008; Cervero et al. 2009; Michael and Yen 2009) on the relationships between environmental conditions and well-being of occupants have focused on actual characteristics of the physical environment such as land use, green spaces, thermal factors, lighting aspects and noise rather than on residents' perceptions of the indoor environment. Some researchers (O'Campo and O'Brien Caughy 2006; Wen et al. 2006) have shown that perceived measures of the environment may be more closely associated with cognitive processes that directly influence ratings of health and quality of life. Few studies (Dawson et al. 2007; Gidlow et al. 2010; Smith et al. 2011) have examined the association between perceived environmental attributes and health. And in these studies, specific aspects of health such as walking, obesity, and quality of life have been studied. Therefore, methodological differences preclude adequate comparison of findings from the present study with those from previous studies.

The present study endorsed a link between perceptions of decay and disorganization in the physical environment and physical health. This finding implies that negative perceptions of the home interior are associated with bodily pain, difficulty or restrictions in daily physical activities. Daily exposure to such difficulties or restrictions can be stressful and impact physical health. However, it is impossible to establish any causal relations between perceptions of the environment and physical health due to the cross-sectional study design. Findings of the present study also imply that perceptions of the physical environment can impact mental health. This finding is in keeping with evidence provided by Poortinga et al. (2007) who observed associations between perceived environmental features and self reported health. However, the mechanisms by which the physical characteristics of the internal environment are related to the health status of individuals are a matter of conjecture. Three pathways may be hypothesized: (1) Consistent with Fullilove and Fullilove's (2000) conception of the connection between housing and health, it is likely that negative perceptions of the interior of the home or perceived inferior socioeconomic level may contribute to worry, anxiety, hopelessness, and depression through cognitions of inadequacy and low self efficacy resulting from social comparisons and social competition that most individuals engage in while appraising their own status or position in society (Kruglanski and Mayseless 1990; Suls et al. 2002). (2) Alternatively, negative perceptions of the home based on social comparisons could lead to family conflicts or marital discord which, in turn, could impact the mental health of individuals. (3) Furthermore, when individuals are dissatisfied with the physical aspects of the interior of their home, they may be less likely to entertain social visits from friends and relatives, and, therefore, enjoy less than optimal social support. In the absence of adequate social support, mental health may be compromised. In short, it is an individual's approximation to the lifestyle considered ideal in his or her culture that mediates the effects of the perceived features of the physical home environment and socioeconomic level on his or her health status. While actual physical characteristics of the household environment may be a potential support or deterrent for health behavior and exert their impact on health through changes in the nervous system or through restrictions imposed on an individuals' mobility or their accessibility to facilities, the link between perceived characteristics of the household physical environment and mental health may be mediated by cognitive processes. That is, the appearance of the environment may convey specific messages which regulate behaviors (Podorefsky et al. 2001) and trigger emotions, which then manifest as indices of mental health.

The lifestyles of most inhabitants of metropolises in Iran reflect a fascinating blend of traditional values and modernization which is evident regardless of the socioeconomic status of the family. Scientific and technological advances and rampant urbanization, on the one hand, and upward social comparisons, on the other, urge most Iranians to strive to move up the social hierarchy. As a result, Iranians' homes have evolved. While social comparison may create a realistic potential for improvement, it may also trigger the painful processes of envy and a feeling of helplessness and despair about one's failure to achieve comparable levels. It is likely that, the physical characteristics of the home and neighborhood are perceived to be indicative of the individual's position on the social hierarchy. When such perceptions are negative, they may contribute to the experience of negative emotional states jeopardizing mental health as well as interpersonal relations. However, insight into the mechanisms underlying the relationships between perceptions of the indoor environment and psychological well-being is still limited and our understanding of these relationships can only be enhanced through robust longitudinal studies.

Studies with larger samples involving diverse environments and comparing the perceptions of environmental characteristics with objective measures of aspects of the physical environment in their associations with health can also help examine the hypothesized pathways through which the physical environment exerts its influence on the health of residents. Future studies could also compare the relationships between objective and perceived characteristics of people's homes with aspects of interpersonal relationships such as marital discord.

A number of limitations are recognized. First of all, as people's perceptions of their surroundings were measured rather than the objective characteristics of the environment, the obtained findings may not be replicated when actual physical features of the home and neighborhood are studied in relation to health. Yet, this does not render the findings of the present study inconsequential as an individual's perceptions can have a significant impact on his or her health. Furthermore, although our findings add to the existing database on the associations between perceptions of the physical environment and health, no inferences regarding causality can be made as cross-sectional data have been used. Finally, while the sample recruited for the study was selected from a crowded downtown area, it may not be representative of the whole population, so caution should be exercised in generalizing the results.

Acknowledgment

This research has not been funded by any outside agency.

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