HOUSING SATISFACTION IN FINLAND WITH REGARD TO AREA, DWELLING TYPE AND TENURE STATUS

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SUMMARY

Aim: This study presents a comprehensive examination of housing satisfaction in Finland and how it associates with different types of residential area, dwelling and tenure status taking into account socio-demographic and socioeconomic variables.

Method: Associations between housing satisfaction and types of residential area, dwelling and tenure status were analysed by multivariate logistic regression using questionnaire data from a random sample of Finnish households (response rate 44%, N = 1,308).

Results: Respondents from rural areas and those living in houses were statistically significantly ($p < 0.05$) more satisfied with indoor thermal conditions in summer than respondents living in city centres (OR 2.01) and apartments (OR 1.75), respectively. Homeowners were more satisfied with the dwelling (OR 3.19), indoor air quality (OR 1.73) and thermal conditions in winter (OR 2.63), and reported moisture or mould damage (OR 0.37) and neighbour noise disturbance (OR 0.60) less frequently than tenants.

Conclusion: Based on this study, the most important factors determining differences in housing satisfaction were tenure status and type of the dwelling. In the context of housing policy development, these results warrant a special consideration of housing quality in rental apartments. The results can also be used for making comparative assessments (e.g. detecting areas of relative strengths or needing improvement) of multifamily buildings and residential areas.

INTRODUCTION

Housing is an important area of research because we spend many hours at home (1), and physical, chemical and biological factors in the home environment can be detrimental to our health and productivity (2). For example, microbial growth due to dampness or moisture damage is a well-known risk factor for asthma symptoms and other respiratory symptoms (3). Noise is associated with sleep disturbance, hearing impairment, myocardial infarction, ischaemic heart disease, and cardiovascular diseases (4–7). Satisfaction with one's dwelling has also been associated with health status: respondents who were satisfied with their dwellings being more likely to report better physical and mental health and also health satisfaction (8).

The housing and living environments have been increasingly recognised as social determinants of health. In general, people with lower socioeconomic position have the worst housing conditions, potentially experiencing, for example, thermal discomfort, exposure to environmental tobacco smoke and dampness and mould in their dwellings as well as exposure to noise and outdoor pollution in their living environment (9–13). Therefore, socioeconomic variables are strong determinants of environmental risks, causing inequalities. These inequalities can be expressed in relation to factors such as income, education, employment, age, gender, and race/ethnicity.

Until 1990, Finland has been a country with a low degree of relative poverty and income inequalities. Since the recession of the early 1990s, relative poverty and income inequalities have grown. The growth rate for income inequality and relative poverty has been rapid enough to draw international attention (14, 15). The main reasons for the growing differences have been changes in manufacturing and the labour market (e.g. increasing unemployment and short-term employment). In parallel, progressive taxation and income transfers to equalize income differences have diminished. Further on, differences in income from capital growth have been resulting from release and globalization of finance as well as change of production.

Social and welfare inequalities can be influenced by health and housing policies, with special emphasis on different population groups where intervention is needed. However, knowledge on differences in environmental health risks between different population groups caused by housing quality in Finland is currently scarce. Research may help to identify the groups with higher environmental health risks related to housing. In addition, information about typical levels of housing satisfaction may be useful for reference purposes, to be utilized in comparative assessments in selected residential areas or samples of buildings for detecting areas of relative strengths or those needing improvement. For this purpose, building owners and decision-makers need information about how housing satisfaction vary between different areas, building types and tenure status.

This study presents a comprehensive examination of housing satisfaction in Finland and how it associates with different types of residential area, dwelling and tenure status, taking into account socio-demographic and socioeconomic variables. The underlying null-hypothesis is that housing quality is independent of the types of residential area, dwelling and tenure status.

MATERIALS AND METHODS

The study material consisted of nationwide cross-sectional survey data collected in 2007. The housing and health survey covered a random sample of 3,000 households in Finland drawn from the Population Register Centre (FPRC) database including one 18–75 year old Finnish speaking resident per household. The residents could participate either by completing and returning a paper questionnaire or by completing the same questionnaire via the Internet. Participation in the study was voluntary. Privacy protection was in accordance with the Finnish Personal Data Act (16) as well as the requirements of the National Institute for Health and Welfare. The questionnaire included a total of 100 questions about respondents' background, living environment and residence (e.g., hygiene, physical and biological conditions, chemical impurities) as well as safety of the living environment and respondents' health and well-being. The response rate was 44% (N = 1,308). The survey was described in more detail elsewhere (17).

First, we identified variables that indicate housing satisfaction, including having enough space in dwelling, satisfaction with the dwelling and indoor air quality (IAQ), temperature conditions of the dwelling in summer and winter, noise disturbance in the dwelling or in the living environment due to traffic or neighbours, and moisture or mould damage on interior surfaces. Some of these variables were chosen based on the WHO-Europe office report (13), which presented the baseline assessment of the magnitude of environmental health inequality in the European region.

Data analyses started by assessing frequencies of independent variables and bivariate associations between the selected housing satisfaction variables and housing characteristics, including self-defined residential areas (city/town centre, suburban area or other urban residential area, urban fringe area, semi-urban area, e.g. parish village, and rural area), dwelling types (apartment block or house, where 'house' includes a detached, semi-detached or row house), and tenure status (home owner, rental tenant). In the following analyses, we constructed models for every housing satisfaction variables by logistic regression. Outcomes were dichotomized into two categories as presented in Table 1. Analyses are illustrated in Figure 1. Models were run by a stepwise procedure. In the first step, a priori variables (Block 1) were entered in the model. A priori variables included selected housing characteristics, as well as socio-

Table 1. *Formulation of variables based on questionnaire data*

Variable	Question	Dichotomizing		
		1	0	Excluded from analyses
Satisfied with dwelling	How satisfied are you with your present dwelling/building?	Satisfied	Fairly satisfied Rather dissatisfied Dissatisfied	No opinion/cannot tell
Satisfied with IAQ	How satisfied are you with the quality of the indoor air in your dwelling?	Satisfied	Fairly satisfied Rather dissatisfied Dissatisfied	No opinion/cannot tell
Suitably warm in summer	What are the temperature conditions in your dwelling? You may choose more than one option.*	Dwelling is suitably warm in summer	Not selected	
Suitably warm in winter	What are the temperature conditions in your dwelling? You may choose more than one option.*	Dwelling is suitably warm in winter	Not selected	
Traffic noise disturbance	Which of the following causes noise disturbance in your residence or residential environment and how frequently? - Road and street traffic	Noise disturbance daily/almost daily	No noise disturbance Noise disturbance weekly Noise disturbance occasionally/seasonally	
Neighbour noise disturbance	Which of the following causes noise disturbance in your residence or residential environment and how frequently? - Noise from neighbour (from dwelling or balcony, such as speech, music, the sound of footsteps, etc.)	Noise disturbance daily/almost daily Noise disturbance weekly Noise disturbance occasionally/seasonally	No noise disturbance	
Moisture or mould	At present, is there any moisture or mould damage in the main living space of your dwelling, and what is the location and extent of the damage? - Yes, on indoor surface	Yes	Not selected	

Dichotomized variables are shown by grouping in the third column, where 0 corresponds with the reference category.
*Options include: suitably warm, too cold, too hot, draughty, cold floor surfaces
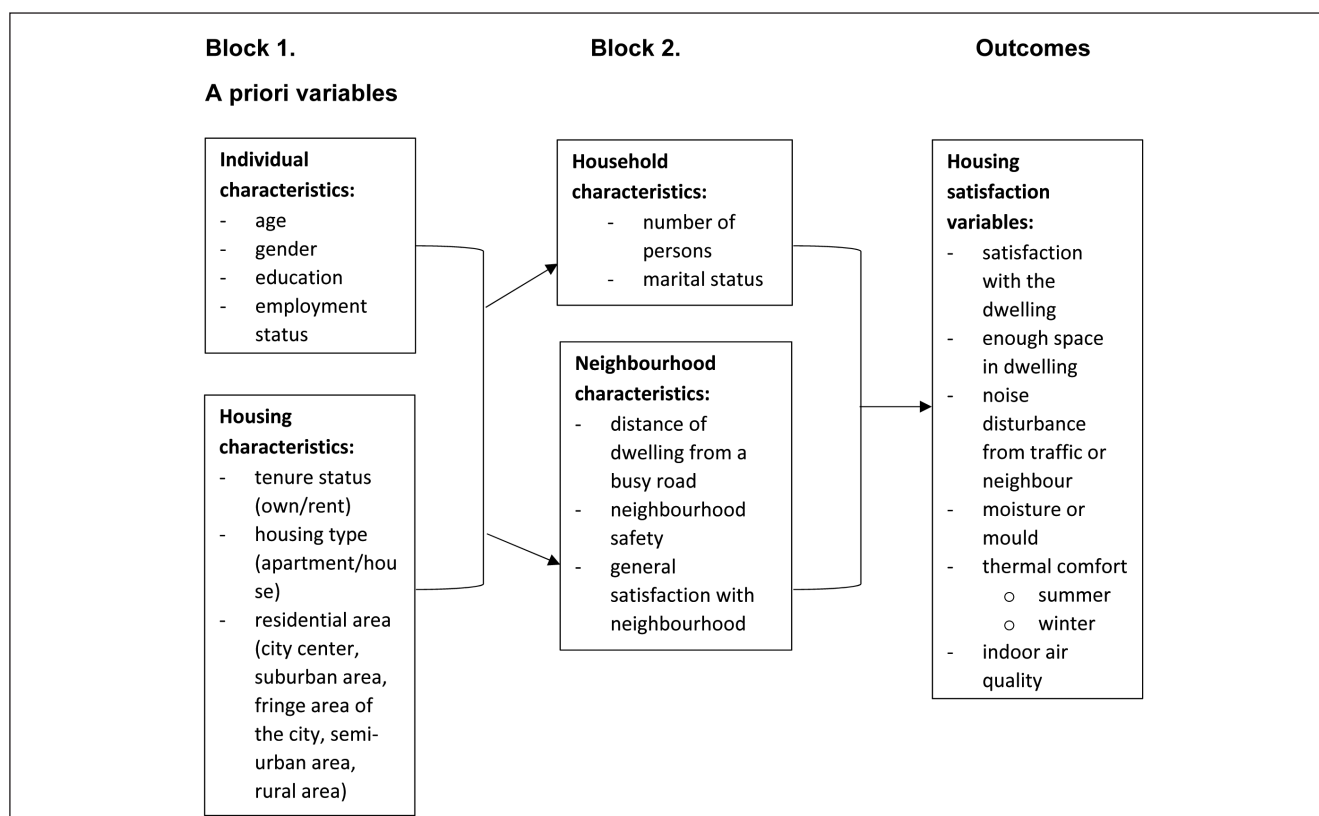
Fig. 1. *Schematic illustration of the multivariate logistic regression analyses.*

demographic variables such as age, gender, and education and employment status that have frequently been related to housing conditions (13). Second step introduced variables from Block 2 in the models using stepwise procedure (entry when p-value <0.05 and removal when p-value >0.10). Level of statistical significance selected was p<0.05. The statistical software used was IBM SPSS Statistics 22.0.

RESULTS

Bivariate Associations

Table 2 shows bivariate-associations between selected housing variables and residential areas, dwelling types and tenure status. There were statistically significant differences between the types of residential areas in satisfaction with IAQ, having enough space in the dwelling, thermal comfort in summer, and both traffic and neighbour noise disturbance. The raw differences between residential areas in the above mentioned housing variables ranged from 14% to 30%. Overall, respondents in more sparsely populated areas reported being satisfied with their living environment more frequently than respondents from densely populated areas.

There were significant differences (raw prevalence differences ranging from 11% to 40%) between dwelling types in all explored variables with an exemption of moisture or mould damage. Respondents living in houses reported better housing quality than respondents living in apartment blocks. With regard to tenure status, home owners reported significantly better housing quality than tenants in all explored aspects, raw prevalence differences ranging from 4% to 35%.

Multivariate Models

Tables 3 and 4 show the results based on multiple logistic regression, where adjusted R-squares for different models varied from 0.12 to 0.35. Residential area was statistically significantly associated with thermal conditions in summer and neighbour noise disturbance so that respondents from rural areas reported more suitable indoor summer temperature (OR 2.01, 95% CI 1.12–3.60) and less noise disturbance (OR 0.30, 95% CI 0.14–0.65) than responders from city or town centres. Correspondingly, respondents from houses reported more suitable indoor summer temperature (OR 1.75 95% CI 1.22–2.50) and less neighbour noise disturbance (OR 0.28, 95% CI 0.19–0.41) than respondents from apartments. In addition, house dwellers were more likely to be satisfied with the IAQ of their dwellings than apartment block dwellers (OR 1.60, 95% CI 1.11–2.29).

Tenure status was statistically significantly associated with satisfaction with the dwelling and IAQ, enough space in the dwelling, and thermal conditions in winter: owner-occupiers were more likely to be satisfied compared to rental dwellers, with odds ratios ranging from 1.73–3.19. In addition, homeowners reported significantly less moisture or mould damage on interior surfaces (OR 0.37, 95% CI 0.17–0.83) and neighbour noise disturbance (OR 0.60, 95% CI 0.39–0.91) than tenants.

With regard to socio-demographic and socioeconomic variables, men were statistically significantly more likely to be satisfied with winter thermal conditions than women. Older respondents were more likely to report dwelling having enough space. They were also more satisfied with winter and summer thermal conditions, and reported less neighbour noise disturbance than younger respondents. Respondents with higher levels of education more likely reported their dwellings suitably warm in

Table 2. Prevalence of housing satisfaction by types of residential area, dwelling and tenure status

	Satisfied with dwelling % (95% CI)	Satisfied with IAQ % (95% CI)	Enough space % (95% CI)	Moisture or mould % (95% CI)	Traffic noise disturbance % (95% CI)	Neighbour noise disturbance % (95% CI)	Suitable warm in summer % (95% CI)	Suitable warm in winter % (95% CI)
Residential area	**	**	***		***	***	***	**
City/town centre	43.6 (36.3–50.9)	39.7 (32.5–46.9)	77.9 (71.9–83.9)	4.4 (1.4–7.4)	37.8 (30.6–45.1)	49.7 (41.9–57.5)	58.0 (50.8–65.2)	74.0 (67.6–80.4)
Suburban/other urban area	45.8 (41.6–50.1)	40.3 (36.1–44.5)	83.3 (80.1–86.5)	4.3 (2.6–6.0)	21.2 (17.6–24.8)	40.5 (36.2–44.8)	69.2 (65.3–73.1)	80.2 (76.8–83.6)
Urban fringe area	50.0 (42.1–57.9)	49.0 (41.1–56.9)	89.5 (84.6–94.4)	6.5 (2.6–10.4)	21.8 (15.0–28.6)	23.6 (16.1–31.1)	69.5 (62.2–76.8)	82.5 (76.5–88.5)
Semi-urban area	50.3 (43.4–57.3)	46.8 (39.9–53.7)	88.1 (83.6–92.6)	7.9 (4.2–11.6)	23.7 (17.7–29.8)	26.0 (19.5–32.5)	76.8 (71.0–82.6)	81.8 (76.5–87.1)
Rural area	55.0 (48.7–61.5)	53.8 (47.3–60.3)	93.8 (90.6–97.0)	4.4 (1.7–7.1)	11.1 (6.8–15.4)	54.0 (47.13–60.9)	84.4 (79.7–89.1)	83.6 (78.8–88.4)
Dwelling type	***	***	***		***	***	***	***
Apartment block	34.5 (29.9–39.1)	30.9 (26.5–35.3)	77.2 (73.2–81.2)	5.7 (3.5–7.9)	33.0 (28.4–37.6)	58.8 (53.8–63.8)	58.1 (53.4–62.8)	73.2 (69.0–77.4)
House	55.1 (51.7–58.51)	51.2 (47.8–54.6)	89.7 (87.6–91.8)	5.0 (3.5–6.5)	16.8 (14.2–19.4)	18.7 (15.9–21.5)	77.8 (75.0–80.6)	84.4 (81.9–86.9)
Tenure status	***	***	***	**	***	***	***	***
Rent	24.3 (18.9–29.7)	24.7 (19.3–30.1)	71.5 (65.9–77.1)	8.8 (5.3–12.3)	34.7 (28.7–40.7)	41.1 (34.8–47.4)	57(50.9–63.2)	62.2(56.2–68.2)
Own	55.2 (52.1–58.3)	50.3 (47.2–53.4)	89.9 (88.0–91.8)	4.4 (3.1–5.7)	19.0 (16.5–21.5)	76.1 (73.3–78.9)	75.7(73.0–78.4)	85.2(83.0–87.4)

**p < 0.01, ***p < 0.001

winter than respondents who had completed middle school only. With regard to occupation, students were less likely to be satisfied with their dwelling than respondents who were retired or not in the workforce. Self-employed persons were less likely to report neighbour noise disturbance.

With regard to household characteristics, both marital status and number of persons in the household were associated with "enough space" in the dwelling, and number of persons in the household was significantly associated with moisture or mould damage on interior surfaces.

From the variables indicating neighbourhood satisfaction, "neighbourhood safety" was associated with all dependent variables with an exception of thermal comfort in winter. Respondents who perceived their neighbourhood safe were more likely to be satisfied with their housing. Respondents who were generally more satisfied with their neighbourhood were more likely to be satisfied with their dwelling and IAQ. Distance from busy road was associated with noise disturbance from traffic.

DISCUSSION

Based on the results of this study, housing satisfaction varied by residential area, type of the dwelling, and tenure status; up to 40% differences were observed in the raw prevalence values between the sub-categories. In case a building owner or area developer would like to make a comparative assessment of housing satisfaction in a sample of dwellings using the results from the national housing and health survey as a reference, it would be important to take this variation into account by comparing the results with a corresponding sub-group of dwellings. For this purpose, we have also calculated the results (both prevalence values and 95% confidence intervals) of the national housing and health survey by residential area, type of the dwelling and tenure status, as indicated in Table 2. Alternatively, the sample of dwellings being assessed should be compared with a corresponding control group of dwellings matched by area, dwelling type and/or tenure status. Also socioeconomic and socio-demographic composition of the samples should be taken into consideration.

In general, utilizing questionnaire data carries the possibility for reporting bias. The response rate was 44%, which is a possible limitation. As compared to the Finnish population and the original (random) sample from FPRC, among respondents women were overrepresented and mean age was higher (18). However, when producing age- and gender-weighted estimates corresponding to the population sample, the prevalence of housing factors remained largely unchanged (data not shown). Therefore, the data can be considered representative in terms of housing factors in Finland, and used as a reference material in future assessments.

Based on the results, tenure status and dwelling type were frequently associated with housing satisfaction. Higher satisfaction with winter temperature conditions among respondents of owner occupied dwellings may at least partly be related to that home owners have more control over the temperature conditions than residents in rental units. It is recommended that the differences in thermal conditions and IAQ between owned and rental apartments should be studied using measured data. Differences observed in summer thermal conditions by residential area could be related to the heat island effect, which means that urban areas are hotter than

Table 3. *Multivariate associations between independent variables and enough space in dwelling, satisfaction with dwelling and IAQ, and moisture or mould of interior surfaces*

	Enough space OR (95% CI)	Satisfied with dwelling OR (95% CI)	Satisfied with IAQ OR (95% CI)	Moisture or mould of interior surfaces OR (95% CI)
Residential area				
Suburban or other urban residential area vs. city/town centre	1.60 (0.92–2.79)	0.93 (0.6–1.44)	0.82 (0.54–1.26)	0.79 (0.31–2.03)
Urban fringe area vs. city/town centre	1.90 (0.83–4.34)	0.93 (0.52–1.64)	1.06 (0.61–1.84)	1.15 (0.34–3.94)
Semi-urban area vs. city/town centre	1.53 (0.73–3.20)	0.90 (0.52–1.57)	0.78 (0.46–1.32)	2.06 (0.71–5.96)
Rural area vs. city/town centre	**2.82 (1.19–6.69)**	0.71 (0.41–1.25)	0.71 (0.42–1.23)	1.27 (0.38–4.19)
Dwelling type				
House vs. apartment block	1.23 (0.73–2.08)	1.35 (0.93–1.96)	**1.60 (1.11–2.29)**	1.37 (0.61–3.09)
Tenure status				
Own vs. rent	**1.87 (1.08–3.24)**	**3.19 (2.06–4.95)**	**1.73 (1.14–2.64)**	**0.37 (0.17–0.83)**
Gender				
Male vs. female	0.89 (0.58–1.35)	0.83 (0.62–1.10)	1.19 (0.91–1.56)	1.34 (0.75–2.42)
Age	**1.04 (1.02–1.07)**	1.00 (0.98–1.01)	1.01 (1.00–1.02)	0.99 (0.96–1.01)
Education level				
High school vs. primary/comprehensive/middle school	0.98 (0.40–2.41)	1.45 (0.71–2.95)	0.68 (0.35–1.32)	0.23 (0.04–1.17)
Professional qualification vs. primary/comprehensive/middle school	0.66 (0.35–1.26)	0.94 (0.63–1.38)	1.11 (0.76–1.62)	0.58 (0.25–1.32)
College degree vs. primary/comprehensive/middle school	0.75 (0.36–1.53)	0.76 (0.49–1.17)	1.14 (0.75–1.73)	0.64 (0.25–1.65)
Academic degree vs. primary/comprehensive/middle school	0.68 (0.33–1.39)	0.85 (0.53–1.36)	1.10 (0.70–1.73)	1.38 (0.57–3.33)
Occupational group				
Student vs. retired/not in the workforce	0.56 (0.20–1.53)	**0.40 (0.16–0.99)**	1.24 (0.53–2.90)	1.21 (0.29–5.16)
Self-employed person vs. retired/not in the workforce	1.09 (0.40 –2.97)	1.27 (0.71–2.28)	1.19 (0.68–2.07)	0.31 (0.06–1.58)
Official/employer vs. retired/not in the workforce	0.65 (0.33 –1.26)	0.82 (0.5–1.22)	0.92 (0.63–1.35)	1.28 (0.57–2.92)
Executive superior official vs. retired/not in the workforce	0.77 (0.32–1.86)	0.74 (0.43–1.28)	0.81 (0.48–1.37)	0.79 (0.23–2.71)
Marital status				
Common-law marriage vs. single	0.72 (0.36–1.42)	–	–	–
Marriage vs. single	0.74 (0.35–1.58)	–	–	–
Divorced/widowed vs. single	**0.26 (0.11–0.63)**	–	–	–
Number of persons in the household	**0.77 (0.67–0.89)**	–	–	**1.28 (1.06–1.54)**
Safety of neighbourhood				
Fairly safe vs. safe	**0.56 (0.37–0.84)**	**0.34 (0.25–0.45)**	**0.42 (0.31–0.56)**	**2.28 (1.25–4.15)**
Rather unsafe/unsafe vs. safe	**0.22 (0.08–0.58)**	**0.31 (0.11–0.88)**	**0.12 (0.03–0.51)**	3.16 (0.79–12.65)
General satisfaction with neighbourhood				
Fairly satisfied vs. satisfied	–	**0.39 (0.30–0.52)**	**0.62 (0.47–0.82)**	–
Rather unsatisfied/unsatisfied vs. satisfied	–	**0.26 (0.14–0.49)**	**0.31 (0.16–0.59)**	–
Adjuster R-square	0.23	0.27	0.20	0.12

Statistically significant OR's (95% CI) are written in bold

rural areas due to heat stored in building materials, such as asphalt, concrete, etc. (19). In addition, the longer distances between neighbours as well as distance from busy roads can explain the decreased risk for noise disturbance in sparsely populated areas.

With regard to neighbourhood characteristics, safety of neighbourhood was most often associated with housing satisfaction. Interestingly, it also appears that safety is associated with distance from busy road. Neighbour noise disturbance might indicate general restlessness in the area, which can increase feeling of insecurity.

Observed associations between satisfaction with the neighbourhood, the dwelling and IAQ can refer to tendency of some respondents to give similar answers. It was also noticed that some of the bivariate associations observed became non-significant following the multivariate logistic regression analyses. This could be partially due to the associations between independent variables

Table 4. *Multivariate associations between independent variables and traffic and neighbour noise disturbance, and thermal comfort*

	Traffic noise disturbance OR (95% CI)	Neighbour noise disturbance OR (95% CI)	Suitable warm in summer OR (95% CI)	Suitable warm in winter OR (95% CI)
Residential area				
Suburban area or other urban residential area vs. city/town centre	**0.61(0.37–1.00)**	1.22 (0.78–1.90)	1.32 (0.89–1.98)	1.18 (0.75–1.86)
Urban fringe area vs. city/town centre	0.99 (0.51–1.93)	0.68 (0.35–1.31)	1.01 (0.59–1.74)	1.18 (0.62–2.23)
Semi-urban area (e.g. parish village) vs. city/town centre	1.08 (0.57–2.05)	1.19 (0.66–2.15)	1.51 (0.88–2.59)	1.02 (0.56–1.86)
Rural area vs. city/town centre	0.92 (0.44–1.94)	**0.30 (0.14–0.65)**	**2.01 (1.12–3.60)**	1.05 (0.56–1.96)
Dwelling type				
House vs. apartment block	0.81(0.52–1.26)	**0.28 (0.19–0.41)**	**1.75 (1.22–2.50)**	1.24 (0.82–1.88)
Tenure status				
Own vs. rent	0.85 (0.53–1.37)	**0.60 (0.39–0.91)**	1.30 (0.88–1.91)	**2.63 (1.74–3.97)**
Gender				
Male vs. female	1.08 (0.76–1.55)	0.79 (0.57–1.10)	1.27 (0.95–1.70)	**1.69 (1.21–2.35)**
Age	0.99 (0.98–1.01)	**0.96 (0.95–0.98)**	**1.03 (1.01–1.04)**	**1.02 (1.01–1.04)**
Education				
High school vs. primary/comprehensive/middle school	1.06 (0.49–2.31)	1.05 (0.50–2.21)	1.20 (0.62–2.32)	**2.47 (1.18–5.16)**
Professional qualification vs. primary/comprehensive/middle school	0.65 (0.40–1.07)	0.94 (0.58–1.50)	1.22 (0.82–1.82)	1.50 (0.97–2.32)
College degree vs. primary/comprehensive/middle school	0.57 (0.32–1.00)	1.06 (0.63–1.77)	0.99 (0.63–1.54)	**2.15 (1.26–3.65)**
Academic degree vs. primary/comprehensive/middle school	0.68 (0.38–1.21)	1.33 (0.78–2.27)	1.11 (0.69–1.78)	1.44 (0.85–2.45)
Occupational group				
Student vs. retired/not in the workforce	0.82 (0.32–2.11)	0.32 (0.26–1.49)	1.64 (0.75–3.59)	1.01 (0.44–2.29
Self-employed person vs. retired/not in the workforce	0.85 (0.39–1.89)	**0.40 (0.18–0.89)**	1.09 (0.59–2.01)	1.12 (0.57–2.23)
Official/employer vs. retired/not in the workforce	1.13 (0.68–1.88)	0.72 (0.46–1.14)	1.03 (0.68–1.54)	1.18 (0.76–1.86)
Executive superior official vs. retired/not in the workforce	1.10 (0.53–2.28)	1.04 (0.56–1.92)	1.41 (0.77–2.56)	1.05 (0.53–2.05)
Safety of neighbourhood				
Fairly safe vs. safe	**2.51 (1.75–3.60)**	**1.87 (1.35–2.58)**	**0.70 (0.53–0.94)**	–
Rather safe/unsafe vs. safe	**4.52 (1.86–11.01)**	**2.45 (1.01–5.97)**	**0.37 (0.17–0.82)**	–
Distance from busy road (m)				
>20–50 vs. 0–20	**0.47 (0.26–0.83)**	–	–	–
>50–200 vs. 0–20	**0.27(0.16–0.45)**	–	–	–
>200–500 vs. 0–20	**0.22 (0.13–0.38)**	–	–	–
>500 vs. 0–20	**0.10 (0.05–0.18)**	–	–	–
Adjuster R-square	0.24	0.35	0.13	0.13

Statistically significant OR's (95% CI) are written in bold

included in the models, such as age, marital status, tenure, type of dwelling, and residential area. For example, older people are more likely to be married and to live in owner-occupied dwellings (20, 21). Houses (including row house and semi-detached) are more likely to be owned by the occupants than apartments, which are more commonly rented.

The adjusted R-squares of multivariable models varied from 12–35%, which means that a large part of the variation in the dependent variables is explained by factors other than those covered in this study. However, this is a typical range in non-experimental (general population-based) environmental health research. It was noted that adjusted R-squares were relatively higher for neighbour noise disturbance and general satisfaction with the dwelling, whereas the lowest R-squares were observed for thermal conditions and moisture or mould damage on interior surfaces.

In this study, gender, age and marital status were used as socio-demographic variables. Education, occupation group and tenure status are indicators of socioeconomic position (8–10, 22, 23). Tenure status is also associated with income: in Finland in 2010 the disposable income per consumption unit was 1.67

times higher for those who owned their dwellings than for tenants (24). Moreover, half of owner-occupier households are free from debt in Finland. Therefore, dwelling type is also associated with income and wealth (25).

Associations between tenure status and housing satisfaction have been reported in other studies. For example, Ellaway and Macintyre (26) found that tenants reported statistically significantly more housing problems related to noise from outside, dampness and/or condensation or keeping their homes warm in winter than owner-occupiers. In Finland, this is a relatively new research area, which makes interpretation of the results challenging. The result of the Residents Barometer 2004 targeting population centres (population > 10,000) were similar to our study, the highest grades of satisfaction with dwelling were given by residents living in detached, semi-detached and row houses, and areas other than city centres and suburban areas (27). In addition, traffic noise disturbance was reported most often by residents of apartment blocks and city centres, which was also observed in our study.

CONCLUSIONS

According to this study, the most important factors determining differences in housing satisfaction were tenure status and type of the dwelling. Respondents from rental apartments perceived worse housing satisfaction related to IAQ and neighbour noise, and also space in the dwelling, satisfaction with the dwelling, moisture or mould damage on interior surfaces, and thermal comfort in winter. Living in apartments was associated with increased dissatisfaction with thermal conditions in summer. Further studies using objective measurements are recommended for more thorough assessment of observed differences by tenure status and dwelling type.

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