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Gender: a risk factor for occupational stress in the architectural profession?

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There is significant evidence that those working in construction are at risk of poor health and well-being due to long working hours, job insecurity, poor work–life balance, low professional worth and temporary teams. There is also a disparate body of evidence which highlights the discrimination experienced by women working in the construction industry. There is, however, a paucity of research exploring gender differences in occupational health and well-being within construction. The current research utilizes standardized measures of occupational health and well-being to identify any gender-determined differences among a sample of architects. A self-completion questionnaire was used to assess job satisfaction, physical health problems, work–life conflict and turnover intentions. Female respondents reported significantly lower overall job satisfaction and significantly higher levels of insomnia and constipation, work–life conflict and turnover intentions. Although further work is needed to understand the causal relationships between variables and the nature of the female architects' dissatisfactions and concerns, the suggestion that women working in the architectural profession are at risk of poorer occupational health and well-being than their male colleagues will be of concern to a profession seeking to embrace diversity.

Keywords: Architects, occupational health and well-being, women, gender differences

Introduction

There is considerable evidence that those working within the construction industry are exposed to a range of stressors which may make them vulnerable to poor health and well-being. These include long working hours (Love and Edwards, 2005), high workload (Haynes and Love, 2004), job insecurity (Loosemore *et al*., 2003), poor professional worth (Lingard, 2003), temporary working teams (Sommerville and Langford, 1993) and poor work–life balance (Lingard, 2003). Given that architects are an integral part of the building process (Salisbury, 1998), it is probable that they are exposed to stressors similar to those suffered by workers in other areas of the sector. In addition there is evidence that architects may experience additional stressors, namely lack of opportunity to use their creative skills (Blau, 1984), a stressful educational process (Anthony, 1987), responsibility for tasks beyond the ability of the individual, unsupportive practice managers and dissatisfaction over career prospects (Cox, 1998). While these studies provide a useful insight into the experiences of architects, they were conducted a number of years ago and their conclusions are in need of reassessment.

The stressors identified above apply to all working within construction and architecture, regardless of gender. There is, however, a significant body of evidence that women working within construction (Goldenhar *et al*., 1998) and the architectural profession experience additional stressors (Caven, 2005). Work within the general working population has suggested that the presence of these additional stressors for female workers places them at risk of poorer health and well-being as manifested by occupational stress (Nelson and Burke, 2000; Linton, 2004).

Much of the extant literature highlighting the poor health and well-being of those working within construction has focused on male samples and has not compared the experiences of men and women working

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within the sector (Loosemore and Waters, 2004). This research aims to investigate any gender differences in occupational health and well-being within the architectural profession.

The experiences of women working within the construction industry

There is significant evidence that women working in the construction industry face additional problems which may result in increased vulnerability to poor health and well-being. For example, female construction workers have been demonstrated to have an increased risk of stress-induced headaches and insomnia which are attributable to sexual harassment and discrimination (Goldenhar *et al.*, 1998). There is also evidence that female construction professionals face stressors in terms of unequal pay (Greed, 2000) and lack of career progression opportunity (Dainty *et al.*, 2000). Reasons for these apparent gender differences may lie in the culture of the construction industry. Discrimination against women has been linked to the attitudes of employers who believe that women lack career commitment and are likely to require maternity leave (Dainty *et al.*, 2000). There is also evidence that women are sidelined into office-based support roles, which do not allow them to develop the skills necessary to gain promotion and therefore compete at parity with their male counterparts (Bagilhole *et al.*, 2000). In addition, much recruitment is undertaken through 'word of mouth' within social networks, many of which exclude women (Pepper, 2005).

Loosemore and Waters (2004) suggest that women working in the construction industry experience less occupational stress than male counterparts, a finding which appears to run contrary to the majority of empirical evidence. The authors did recognize that men and women experience similar stressors, namely those associated with a high pressure environment where meeting tight deadlines is essential. In addition, they revealed that female construction professionals report greater stress in relation to opportunities for personal development, rates of pay, keeping up with new ideas, business travel, and the cumulative effect of minor tasks. Given the additional difficulties experienced by women working in the construction industry, it is perhaps surprising that Loosemore and Waters (2004) identify lower levels of stress among women. However, the research is important as it directly compares the health and well-being of men and women working in the construction industry, something which has been lacking in previous research (Loosemore and Waters, 2004). This may be because there are too few women working within the construction occupations or organizations to make direct statistical comparisons.

Approximately 37% of architectural students and 13% of qualified architects in the UK are female (de Graft-Johnson *et al.*, 2007), which is higher than the 10% seen within other areas of construction (CITB, 2004). Architecture may, therefore, be an appropriate occupational group to study in order to ensure that any sample contains enough women to make direct comparisons with male counterparts. In addition, there is evidence that female architects experience stressors experienced by other female construction professionals.

Women in the architectural profession

The number of women engaged in architectural higher education has shown an increase in recent years. Figures from the Higher Education Statistics Agency (HESA) reveal that the proportion of women on architectural degrees has increased from 27% in 1999/2000 (HESA, 2001) to 33% in 2004/5 (HESA, 2005). Despite these increases, the proportion of women engaged in professional practice has remained at approximately 14% (RIBA, 2002) and has not shown a comparable increase (de Graft Johnson *et al.*, 2005). It has been suggested that women must be leaving the profession after qualification (*ibid.*). What is not clear from the figure of 14% provided by the Royal Institute of British Architects (RIBA) (2003) is whether this refers to the total number of women working in professional practice, or those who have registered with either the RIBA or the Architects Registration Board (ARB). Registration with the ARB requires that an individual must have passed RIBA validated exams (Parts I, II and III) and have gained two years' work experience. A chartered architect is one who has achieved the above qualifications and is registered with the ARB (RIBA, 2007). Thus, there may be more women working in practice who have chosen not to register with either of the professional bodies.

There has been a body of research exploring women's roles in architecture (see for example, Attfield and Kirkham, 1989; Berkeley and McQuaid; 1989; Coleman *et al.*, 1996). Much of this research exploring the experiences of women working in the architectural profession has been conducted in the USA and has focused on the historical aspects of women in the profession, viewing women as martyrs or victims (Adams and Tancred, 2000). Work conducted by Kingsley and Glynn (1992) reported that female architects experience discrimination on site and within practices, earn less than male counterparts and that their work is not as highly valued. Anthony (2001)

reported that female architects may become trapped in poor working conditions, owing to the economic uncertainty of the profession. In addition women may find that they are restricted to certain tasks, are therefore unable to make full use of the skills and may not be able to develop the skills necessary to achieve promotion. Anthony (2001) also noted that women report poorer career satisfaction and may experience poor work–life balance.

Whitman (2005) identified similar issues among female architects working in Australia. She noted that, while many felt satisfaction with their balance between work and non-working life (possibly because many said that they would sacrifice career progression for a healthy work–life balance), many were dissatisfied regarding pay, career progress and long-term career opportunities.

Within the UK, female architects report discrimination and marginalization beginning during higher education where masculine ideals are perpetuated through competitions and the star system (Fowler and Wilson, 2004). Once in practice female architects find that having a child can have a dramatic impact on their career; part-time work is not accepted (*ibid.*). Caven (2005) reported that female architects may establish their own practices in order to survive the architectural profession and determine their own working practices. de Graft Johnson *et al.* (2005) reported that women choose to leave the profession due to low pay, long working hours, family unfriendly working hours, sidelining, glass ceiling, stressful working conditions, paternalistic culture, sexist, job insecurity and limited areas of work. Some of these factors may also affect men working in the profession, for example, low pay and long working hours.

While the work of Caven (2005) and de Graft Johnson *et al.* (2005) provides useful insights into the experiences of women working in the architectural profession, they are not able to draw direct comparisons with the experiences of men. Both studies used all-female samples. It is difficult to determine if the factors they discuss are specific to female architects, or would apply to male architects. In addition, the work of de Graft Johnson *et al.* (2005) focuses on those who have already left the profession. Since their sample have made a decision to leave architecture, they are examining their experiences retrospectively, and as such they may be distorted. Similar concerns can be raised about the sample in Caven's (2005) work. Although the women in her sample were still working as architects, they had chosen to leave architectural practice in order to become self–employed; as such they are viewing their employment experiences retrospectively. Individuals who are asked to discuss events in retrospect may not be accurate in their description of events, and may have a biased perspective. This is called 'recall bias' and is a significant area of concern in studies that rely on retrospective data (Blane, 1996). This does not mean that data collected via these methods do not reflect reality, but that there is a need to investigate such phenomena with those currently working within the profession.

Given that female architects potentially face the stressors experienced by male architects, and additional stressors, they may experience poorer health and well-being. There is evidence that stressors are associated with increased turnover for all employees (Irvine and Evans, 1995) and there is additional evidence that the presence of these stressors results in female architects choosing to leave employment and become self-employed, or leave the profession altogether. Accordingly it can be expected that female architects will report higher turnover intentions.

In sum, although these previous studies have provided valuable insights into the lived experiences of architects, there remains a need to explore the role of gender in defining these experiences and in influencing well-being. This paper aims to achieve this by identifying any gender differences in occupational health and well-being of both male and female architects who are currently working in the profession.

Method

In order to compare the experiences of men and women working within the architectural profession, a self-completion questionnaire utilizing standardized measures of work-related health and well-being was used. Questionnaires are widely used within work-related health and well-being literature (Symon and Cassell, 2006) and are particularly useful for measuring attitudes of individuals. Established instruments demonstrate high measurement validity for well-constructed and tested measures (Johnson and Turner, 2003).

The questionnaire measured four aspects of health and well-being: affective well-being; physical symptoms of stress; work–life conflict and turnover intentions. The components of the questionnaire are discussed below.

Job satisfaction

Job satisfaction was assessed using a tool based on Warr *et al.* 's (1979) scale of global job satisfaction. This research tool asks informants to rate their satisfaction on a seven-point Likert scale (from extremely satisfied to extremely dissatisfied) with a range of job

characteristics, including working conditions, relationships with colleagues, pay, working hours, opportunity to use your abilities, job security and promotion. Administration of a pilot questionnaire led to a number of minor amendments to the original scale. Additional items were added (satisfaction with working conditions both on site and in the office, relationship with subordinates, relationship with clients and relationship with other construction professionals). Other changes included changing 'boss' to 'line manager' and 'firm' to 'practice', making the question specific to architects. The global job satisfaction scale (Warr *et al.*, 1979) has previously been demonstrated to have a high degree of reliability (Fields, 2002). The coefficient alpha for this scale was $\alpha=0.9104$, indicating high reliability.

Physical symptoms of stress

In order to identify physical health problems experienced by architects the physical symptoms inventory (PSI) was used. This scale was developed by Spector *et al.*, (1988) and assesses a range of symptoms; it asks respondents to indicate if they have experienced each symptom in the previous 30 days and if they spoke to their doctor about that symptom. The original scale included 19 items. Feedback from the pilot questionnaire indicated that additional items relating to restless legs and pins and needles should be included in the scale. The PSI is a causal indicator scale rather than one that investigates an underlying construct; therefore internal reliability scales are not relevant (Spector and Jex, 1998).

Work–life conflict

Work–life conflict is associated with job satisfaction (Kinnunen *et al.*, 2004) and turnover (de Graft-Johnson *et al.*, 2005). A seven-item scale was developed, using existing tools as a template (Small and Riley; 1990; Bacharach *et al.*, 1991) which have both been shown to have high reliability and validity (Fields, 2002). Respondents were asked to rate the extent to which they agreed with a number of statements regarding work–life balance using a five-point Likert scale which ranged from 'strongly agree' to 'strongly disagree'. Sample items on the scale were 'It has been difficult for me to fulfil my family responsibilities because of the amount of time I spend on my job' and 'My marriage/relationship suffers because of my work'. The coefficient alpha for work–life conflict was $\alpha=0.8967$, indicating that the scale was reliable.

In order to ensure that low numbers indicate poor well-being, strongly agree was coded as 1, agree as 2, neither agree not disagree coded as 3, disagree as 4 and strongly disagree as 5. A respondent's average work–life conflict score could then be calculated.

Turnover intentions

The high turnover of female architects is a source of concern among those in the architectural profession (de Graft-Johnson *et al.*, 2005) and has previously been associated with poor well-being among civil engineers (Lingard, 2003). Accordingly a four-item scale was developed, which asked respondents to state the extent to which they agreed with statements about turnover desires and active turnover intentions. The coefficient alpha for turnover intentions was $\alpha=0.8349$, indicating the reliability of the scale. Items were rated along a five-point Likert type scale where 1=strongly agree and 5=strongly disagree. Statements were;

(1) I often think about leaving my job.
(2) I often think about leaving the architectural profession.
(3) I will be actively searching for a new job over the next 12 months.
(4) I will be actively searching for a job outside of the architectural profession over the next 12 months.

These statements allowed for an analysis of respondents' desires to leave their current employer and their chosen profession.

Sampling strategy

The questionnaire was distributed to 1200 architects working in different areas of the UK (London, East Midlands, Norfolk, Suffolk, Bristol, Birmingham, Liverpool, Newcastle, Dundee and Belfast). These regions were selected so as to provide a stratified sample of respondents from across the UK. In this sense the sampling strategy was to yield a convenience sample, rather than a probability sample. Convenience samples are useful when conducting exploratory research within a target population (Ferber, 1977), in this case architects. A total of 120 questionnaires were returned (a response rate of 10%), 110 of which were fully completed.

Contact details of architects were obtained using the websites of the RIBA and the ARB. All architects registered in the areas detailed above that had e-mail addresses were e-mailed a copy of the questionnaire which could be completed online or printed and then returned via the postal system. Using the websites of the RIBA and ARB limits the sample to those who have achieved registration or chartered status. In order to contact those working at part III or lower a short article was published in *Building Design* magazine, which

summarized the aims of the research and provided contact details for the research project. This publication is distributed to all people working within the architectural profession. Although the response rate was relatively modest, this return rate is comparable to similar studies (Cheng and Li, 2002; McDermott *et al.*, 2007).

Data analysis

Mean scores were calculated for both male and female respondents. As data were not normally distributed, non-parametric tests were conducted. The Mann–Whitney U test allows for a comparison of means to be carried out, identifying any significant differences in the mean scores for men and women. These were conducted on mean results for job satisfaction, work–life balance and turnover intentions. The physical symptoms inventory does not allow for means to be calculated, rather the frequency of response is recorded. Accordingly a chi-square procedure was carried out to determine if men and women reported significant differences in frequency of physical symptoms.

Findings

Sample characteristics

Details of the sample characteristics are provided in Table 1. The sample consisted of 75 males and 35 females. The age of respondents ranged from under 25 to over 60 with a mean age of 35 to 40 years (SD=2.234). The majority of respondents identified themselves as White British or Caucasian (78%).

Gender differences could be seen in the level of qualification, with a higher proportion of male respondents having attained chartered status (74%) compared with 42% of female respondents. This could be explained by the fact that a greater proportion of female respondents was under the age of 35 (60%) compared to 50% of male respondents. The number of years at the highest level of qualification ranged from two months to 45 years, with a mean of 8.6 years (SD=10.06).

It can be seen from Table 1 that female respondents were generally younger than male respondents, were less likely to have dependants and less likely to be chartered architects (i.e. were at a relatively less advanced stage of their career). This must be considered when discussing any gender differences that arise in responses.

Table 1 Sample characteristics delineated by gender

	Males	Females
N	75	35
Dependants (%)	51	74
Part I qualified (%)	1	3
Part II qualified (%)	4	3
Part III (%)	0	3
ARB registered (%)	20	40
Chartered (%)	74	43
Self-employed (%)	21	14
Full time (%)	99	87
Managerial responsibilities (%)	71	51
Single (%)	32	43
Married (%)	49	34
Cohabiting with partner (%)	13	20
Partner who do not live with (%)	5	3
Under 25 years old (%)	1	6
25 to 30 years old (%)	21	20
30 to 35 years old (%)	28	34
35 to 40 years old (%)	5	11
40 to 45 years old (%)	9	14
45 to 50 years old (%)	4	3
50 to 55 years old (%)	16	7
55 to 60 years old (%)	8	3
60 years plus (%)	7	0

Organizational size ranged from one employee (the self-employed respondents) to 900 employees. Thirty per cent of respondents worked in a practice employing 10 people or fewer, 17% in a practice employing between 11 and 20 people, 40% in practices that employed between 21 and 100 people, with 13% working in practices employing over 120 people. Therefore, the majority of the sample worked in relatively small practices. Seventy-one per cent of respondents had managerial responsibilities, supervising between 1 and 56 employees. There was no significant gender difference in the size of practice worked for. Respondents were employed in a wide range of job titles and levels of seniority and worked an average of 5.03 hours per week on site, 35.5 hours in their office and 3.75 hours at home. The overall mean working week was 42.23 hours. There was no gender difference in the number of hours worked. Sixty-four per cent of respondents had taken sick leave in the 12 months prior to completing the questionnaire, with a mean number of days of 3.27 (SD=10.34). There was no significant gender difference in sick leave.

Job satisfaction

Table 2 presents the mean scores for men and women, from which it can be seen that, for most items, male respondents reported higher (mean) satisfaction with items on the job satisfaction scale. Female respondents

Table 2 Descriptive statistics (number, mean and standard deviation) of responses to items on job satisfaction scale, by gender

Item		N	Mean	Standard deviation	U	Significance
Physical working conditions in studio	**Male**	**75**	**5.23**	**1.331**	**810.5**	**0.001**
	Female	**35**	**4.26**	**1.521**		
Physical working conditions on site	Male	62	4.87	0.914	749	0.397
	Female	27	4.70	0.869		
Freedom to chose method of working	Male	74	5.24	1.441	1061.5	0.116
	Female	35	4.83	1.543		
Relationship with fellow workers	Male	72	5.51	1.138	1172.5	0.710
	Female	34	5.47	1.051		
Recognition for work	Male	75	4.81	0.382	1129.5	0.223
		35	4.46	1.400		
Line manager	Male	66	5.08	1.481	869	0.220
	Female	31	4.65	1.603		
Amount of responsibility	Male	73	5.52	1.144	1146.5	0.365
	Female	35	5.26	1.268		
Rate of pay	Male	75	4.32	1.544	1098	0.159
	Female	35	3.86	1.630		
Opportunity to use abilities	Male	75	4.89	1.590	1109	0.179
	Female	35	4.57	1.461		
Industrial relations between management and workers	Male	72	4.88	1.342	0.957	0.156
	Female	32	4.44	1.544		
Opportunity of promotion	**Male**	**67**	**4.49**	**1.561**	**702**	**0.005**
	Female	**32**	**3.59**	**1.388**		
The way your practice is managed	**Male**	**74**	**4.43**	**1.672**	**994**	**0.044**
	Female	**35**	**3.80**	**1.568**		
Attention paid to suggestions	Male	73	4.70	1.478	1134	0.334
	Female	35	4.43	1.539		
Hours of work	Male	75	4.64	1.439	1219	0.537
	Female	35	4.40	1.594		
Amount of variety in work	Male	75	4.89	1.341	1099	0.153
	Female	35	5.17	1.505		
Job security	Male	75	4.97	1.498	1265.5	0.756
	Female	35	5.00	1.188		
Relationship with clients	Male	74	5.38	1.094	1246.5	0.934
	Female	34	5.44	1.050		
Relationship with other construction professionals	Male	75	5.47	0.949	1229	0.551
	Female	35	5.40	0.946		
Relationship with subordinates	Male	56	5.41	0.949	451.5	0.723
	Female	17	5.59	0.712		
Intrinsic job satisfaction	Male	75	5.13	0.954	1182	0.175
	Female	35	4.95	0.938		
Extrinsic job satisfaction	**Male**	**75**	**4.89**	**0.899**	**987**	**0.015**
	Female	**35**	**4.46**	**0.889**		

Table 2 Continued.

Item		N	Mean	Standard deviation	U	Significance
Overall job satisfaction	**Male**	**75**	**5.01**	**0.854**	**1068**	**0.048**
	Female	**35**	**4.71**	**0.844**		

Note: Significant results in bold.

reported higher (mean) satisfaction with four items: the amount of variety in work, job security, relationship with clients and relationship with subordinates. Male respondents reported higher intrinsic, extrinsic and overall job satisfaction than female respondents. It would seem that male respondents in this sample experience greater job satisfaction than female respondents, with the exceptions detailed above.

Table 2 shows the results of Mann–Whitney U tests on gender differences in job satisfaction. Although male respondents reported greater job satisfaction for most items, only three differences were statistically significant. Female respondents were significantly less satisfied with their physical working conditions within the studio ($U=810.5$, $p=0.001$), with their opportunity for promotion ($U=702$, $p=0.005$), with the way that their practice is managed ($U=994$, $p=0.044$). In addition women were less satisfied with items that are extrinsic to their job ($U=987$, $p=0.015$) and experience lower overall job satisfaction ($U=1068$, $p=0.048$). This indicates that female architects in the sample experienced significantly lower job satisfaction than male architects.

Physical symptoms of stress

In order to determine any gender differences in the reporting of physical symptoms of stress, the frequency of reporting for male and female respondents was calculated and tabulated below. From Table 3 it can be seen that for 15 of the symptoms, more female than male respondents reported experiencing them. For five of the symptoms (skin rash, fever, acid indigestion, dizziness and restless legs) a higher percentage of male respondents reported experiencing them.

To determine if these differences in frequency were significant, a chi-square procedure was carried out. Most of the differences were not significant. More females reported difficulty sleeping and this proved to be statistically significant χ^2 $(1, N=110)=16.9$, $p>0.05$. In addition, more females reported experiencing constipation $\chi^2(1, N=110)=12.87$, $p>0.05$. It can then be said that female respondents experienced more physical symptoms of stress than male respondents, and that this difference was statistically significant, for trouble sleeping and constipation. The lack of statistical significance for other symptoms could result from the difference in sample sizes. Further chi-square tests revealed that there was no statistically significant difference in reporting of symptoms to colleagues or line managers by male and female respondents.

Work–life conflict

The mean and standard deviations for male and female respondents to items on the work–life conflict scale were calculated and are presented in Table 4. For every item on the work–life balance scale, female respondents reported greater agreement with statements than male respondents (Table 4). This suggests that female architects in this sample experience greater work–life conflict than male architects in this sample. Mann–Whitney U tests were carried on the data to determine the statistical significance of these differences (Table 4).

It can be seen that for two items on the work life–balance scale (difficulty doing household chores and difficulty switching off) the increased work–life conflict expressed by female respondents was statistically significant at the 0.05 level. Female respondents indicated greater agreement with the statement that 'I have come home from work (several times a month) to do the chores that need to be done' ($U=1063.5$, $p=0.05$). Female respondents also indicated greater agreement with the statement 'I find it difficult to ''switch off'' when I finish work' ($U=912$, $p=0.003$). This may relate to female respondents reporting greater difficulty in sleeping. In addition, female respondents expressed significantly greater overall work–life conflict than male respondents ($U=998.5$, $p=0.022$). From these data and statistics it can be said that female respondents within the sample presented here experience greater work life conflict than male respondents.

Turnover intentions

Table 5 presents the descriptive statistics for items on the turnover intention scale delineated by gender. Female respondents reported greater agreement for each item on the turnover intention scale, indicating greater turnover intentions. Mean turnover intentions

Table 3 Frequency of reporting of physical symptoms of stress by gender (presented as a percentage) (Males N=75 and Female N=35)

Item		No. (%)	Yes but did not see a doctor (%)	Yes and did see a doctor (%)
Nausea	Male	68	30.7	1.3
	Female	54.3	40	5.7
Backache	Male	57.3	41.3	1.3
	Female	51.4	45.7	2.9
Trouble sleeping	Male	52	44	4
	Female	20	77.1	2.9
Skin rash	Male	81.3	16.	2.7
	Female	82.9	14.3	2.9
Breathlessness	Male	89.3	10.7	0
		85.7	11.4	2.9
Chest pain	Male	92	5.3	2.7
	Female	85.7	11.4	2.9
Headache	Male	44	54.7	1.3
	Female	31.4	65.7	2.9
Fever	Male	86.7	12	1.3
	Female	91.4	8.6	0
Acid indigestion	Male	70.7	29.3	0
	Female	77.1	22.9	0
Eye strain	Male	48	50.7	1.3
	Female	42.9	57.1	0
Diarrhoea	Male	78.7	20	1.3
	Female	71.4	28.6	0
Stomach cramps	Male	89.3	8	2.7
	Female	80	17.1	2.9
Constipation	Male	92	6.7	1.3
	Female	71.4	28.6	0
Heart pounding	Male	89.3	9.3	1.3
	Female	82.9	14.3	2.9
Infection	Male	85.3	6.7	8
	Female	77.1	20	2.9
Loss of appetite	Male	89.3	9.3	1.3
	Female	80	20	0
Dizziness	Male	85.3	14.7	0
	Female	85.7	14.3	0
Restless legs	Male	77.3	22.7	0
	Female	77.1	20.9	2.9
Pins and needles	Male	84	16	0
	Female	74.3	25.7	0
Fatigue	Male	24	73.3	2.7
	Female	2.9	94.3	2.9

Table 4 Descriptive statistics (N, mean, standard deviation) for items on the work–life balance scale, by gender and results of Mann–Whitney U test comparing the responses of male and female respondents, to items on the work–life balance scale

Item		N	Mean	Standard deviation	U	Significance (p)
It has been difficult for to fulfil my family responsibilities because of the amount of time I spend on my job	Male	75	3.17	**1.10**	1197	0.224
	Female	35	3.00	**1.03**		
I have arrived at work too tired to function well because of the household work I have done	Male	75	3.79	**1.02**	1253	0.344
	Female	35	3.69	**1.05**		
I have come home from work too tired (several times a month) to do the chores which need to be done	**Male**	**74**	**2.70**	**1.19**	**1063.5**	**0.054**
	Female	**35**	**2.29**	**0.957**		
My marriage/relationship suffers because of my work	Male	62	3.31	**1.20**	693.5	0.218
	Female	25	3.12	**1.20**		
I feel that my work prevents me from being as good a parent as I would like to be	Male	36	3.24	**1.27**	185.5	0.392
	Female	11	3.27	**1.10**		
I find it difficult to 'switch off' when I finish work	**Male**	**75**	**2.91**	**1.18**	**912**	**0.003**
	Female	**35**	**2.29**	**1.20**		
My work affects my enjoyment of my social life	Male	75	3.28	**1.16**	1114	0.094
	Female	35	2.97	**1.18**		
Overall work–life balance	**Male**	**75**	**3.22**	**0.83**	**998.5**	**0.022**
	Female	**35**	**3.89**	**0.84**		

Note: Significant results in bold.

were also greater for female respondents. These figures suggest that female respondents in this sample experienced a significantly greater desire to leave their current position and the profession than male respondents. A Mann–Whitney U test was conducted to test the statistical significance of these gender differences (results presented in Table 5). It can be seen that female respondents were significantly more likely to be

Table 5 Descriptive statistics for items on the turnover intention scale by gender and results of Mann–Whitney U tests, determining the significance of gender differences in responses to items on the turnover intention scale

Item	Gender	Mean	Standard deviation	U	Significance
I often think about leaving my job	Male	3.40	1.28	1108	0.089
	Female	3.17	1.34		
I often think about leaving the architectural profession	Male	3.23	1.31	1192.5	0.214
	Female	2.89	1.26		
I will be actively searching for a new job over the next 12 months	**Male**	**3.45**	**1.35**	**1003**	**0.021**
	Female	**2.94**	**1.21**		
I will be actively searching for a new job outside of the architectural profession over the next 12 months	Male	4.07	0.04	1127.5	0.106
	Female	3.77	1.19		
Mean turnover intention	**Male**	**3.20**	**0.825**	**1008**	**0.025**
	Female	**2.89**	**0.839**		

Notes: Males, N=75; Female, N=35. Significant results in bold.

searching for a new job ($U=1003$, $p=0.021$) and that female respondents had significantly higher mean turnover intentions ($U=1008$, $p=0.025$).

Discussion

The data presented here suggest that women working within the architectural profession are at greater risk of poor health and well-being as a result of occupational stress. Overall female architects appear to experience lower job satisfaction, poorer physical health, higher work–life conflict and higher turnover intentions. A cross-sectional approach, such as the one employed here, does not allow for an analysis of the causal impact of the culture and structures of the architectural profession on those working within it. Nor does it enable reasons for the observed gender differences to be definitely stated. However, the findings can be interpreted in relation to previous research.

The female architects in the sample presented here reported lower overall job satisfaction than their male colleagues. This runs contrary to other studies which have reported that women in the general population experience higher job satisfaction than men (Sousa-Poza and Sousa-Poza, 2000) or that there should be no significant gender differences (Clark, 1997). It has been argued that women's higher job satisfaction may be linked to lower expectations of work (Clark, 1997) or that women judge their success against other women and therefore have lower expectations (Hodson, 1989). However, when women express similar expectations of work to men, lower job satisfaction has been reported (Zanna *et al.*, 1989). Female architects' lower job satisfaction may be linked to their expectations of work and this is an area which warrants further research. It is important to note that female architects in the current study were younger and therefore less experienced than male architects. It may be that issues of poor job satisfaction are linked to women's relative youth and lower experience. Any relationship between age, experience and job satisfaction warrants further investigation.

The female architects in the current study expressed lower job satisfaction over career prospects, a finding which is supported by other empirical research. Architecture and construction-specific literature has demonstrated that women express dissatisfaction over career prospects (Dainty *et al.*, 2000; Anthony, 2001). Reasons for female architects' lower satisfaction with practice management are not possible to determine from the data presented here. However, previous work has demonstrated that female architects experience discrimination within practices, for example through marginalization (Fowler and Wilson, 2004). This can lead to female architects choosing to establish their own practices in order to control their working conditions (Caven, 2005). Further work is needed to determine the nature of female architects' comparative dissatisfaction with the practice management.

Female architects in the current study reported a higher frequency of insomnia and constipation, a finding which is supported by the existing literature. Women in the general population are more likely to report insomnia than men (Groeger *et al.*, 2004). However, it is not clear whether women actually experience more difficulties, or if they are more likely to report them. Previous research has demonstrated that women in the construction industry are more likely to report insomnia (Goldenhar *et al.*, 1998). The reasons for this gender difference are not possible to establish in cross-sectional survey work, but it has been suggested that insomnia and headaches among women construction operatives is linked to harassment and discrimination (Goldenhar *et al.*, 1998).

Greater work–life conflict was reported by female architects. Work–life conflict has been demonstrated as a problem for men and women working in construction (Lingard, 2003; Sutherland and Davidson, 1993; Haynes and Love, 2004; Ng *et al.*, 2005). Within architecture, family unfriendly working practices have been cited as reasons for women choosing to establish their own practices (Caven, 2005) and leave the profession (de Graft Johnson *et al.*, 2005). This suggests that female architects may experience problems due to family commitments and this may explain their experience of work–life conflict. However, the majority of women within the current study did not have dependants and so family commitments may not explain the findings reported here.

Female architects reported greater difficulty switching off after work. This may be linked to their reporting of insomnia. Previous literature has demonstrated a link between the two within the general workforce (Weyers *et al.*, 2006). Linton (2004) has reported that people may respond to stress at work by experiencing disturbing thoughts which make sleep difficult. It could be that female architects worry about work more than male counterparts, and as such experience greater difficulty sleeping.

Turnover intentions for the current sample were higher for female architects than for their male counterparts. The work of Caven (2005) and de Graft Johnson *et al.* (2005) has argued that female architects' experience of discrimination and inequality at work lead them to leave employment, either to become self-employed or to work in other sectors. Unlike Caven (2005) and de Graft Johnson *et al.* (2005), the current work utilized a mixed sample.

Therefore it can be seen that female architects' turnover intentions are higher than men's. High job satisfaction has been linked to a reduction in turnover intentions within other sectors (Irvine and Evans, 1995; Spector, 1997; Buchbinder *et al*., 2001). It could be that female architects' lower job satisfaction is linked to their increased desire to leave their current job. In particular, dissatisfaction with practice management may be a factor in turnover intentions. Given the cross-sectional nature of the current study it is not possible to determine causal relationships. However, if female architects are leaving their employment due to employment practices then further work could identify particular problems with management practices and develop recommendations to improve female architects' experience of work and therefore reduce their turnover intentions.

Female architects reported greater dissatisfaction with physical working conditions, practice management and opportunities for promotion. These are areas where architectural practices may be able to effect change in order to retain their female employees. Those running practices could examine their promotion procedures to ensure that female architects are not discriminated against. Further research needs to understand the nature of female architects' dissatisfaction with promotion prospects, working conditions and practice management. Such work could provide concrete ideas for improving the health and well-being of female architects, thereby improving retention for the profession.

Conclusions

Although previous studies have provided valuable insights into the lived experiences of architects, little attention has been focused on the role of gender in defining these experiences and in influencing well-being. Accordingly, this research compared the occupational health and well-being of both male and female architects.

The results reveal that female architects report poorer health and well-being than their male counterparts. It has been shown that female architects reported lower overall job satisfaction in comparison to men. In addition, they are more likely to experience certain physical health problems associated with poor well-being (insomnia and constipation) and higher work–life conflict and turnover intentions. In the light of the supporting literature, it is probable that these findings relate to women's subordinate position within the construction industry and the architectural profession. This research has also revealed that there are likely to be significantly higher levels of attrition among women architects.

Further work is needed to understand the nature of female architects' apparent difficulties and to establish recommendations to improve their health and well-being. Understanding why female architects reported greater dissatisfaction with practice management could allow for the development of organizational policies that help to improve their experience of work. This in turn could lead to a reduction in the organizational and occupational turnover of female architects. It is also important to note that the data presented here are cross-sectional and therefore experience the limitations associated with the chosen methodology. It is not possible to determine the causal relationships between variables or to explore changes in health and well-being over time. A self-completion questionnaire using standardized tools does not allow for respondents to elaborate on their responses or to discuss aspects of their working environment which might be of particular relevance to them. Further research could explore the nature of relationships between variables, for example, turnover and job satisfaction through qualitative data, which would also allow respondents to discuss the nature of their dissatisfaction.

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