To study gender differences of employee on perceived indoor environment quality and productivity: preliminary study in Punjab.

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Abstract

Providing optimal, or at least comfortable environment that can satisfy a majority of occupants is deemed to be important, and has been the primary goal of conventional facilities management practice, particularly in the context of commercial office environments in which individual occupant's control over their surrounding environments is usually restricted.It is imperative that we pay utmost attention to our indoor environment to achieve optimal level of effective productivity. Building occupants often react in noticeably different ways under the same indoor environment, leading to a presumption that various socio demographic variables beyond environmental parameters influence occupants' perception of the quality of indoor environment. Aim of the present research was to study the effect of gender of employee on perceived indoor environment quality and productivity. The totals of 600 employees from various offices of Punjab were recruited as sample. The age range of the sample was between 25 to 55 years. Sample was divided into two groups Group 1 consisted of 310 male employees and Group II consisted of 290 female employees. It was observed that significant gender differences were found on satisfaction with the office temperature. Male employees were found to be more satisfied with their temperature as compared to their female counterparts.

Keywords: environment, gender, perceived satisfaction, correlate, Design, Built environment

1. Introduction

Poor indoor environmental quality (IEQ) can have adverse effects on occupants' health and productivity. Indoor environments deemed satisfactory by a certain occupant group may not be satisfactory to another. Building occupants often react in noticeably different ways under the same indoor environment, leading to a presumption that various socio demographic variables beyond environmental parameters influence occupants' perception of the quality of indoor environment. In fact, despite a very large number of indoor environment surveys, only a few specifically address the age related effect. Western literature had reported women being less satisfied with indoor environment [3][1][4][8][2].Choi et al., Carried out an Investigation on the impacts of different genders and ages on satisfaction with thermal environments in office buildings. The statistical analysis of air temperatures, occupant thermal satisfaction, age and gender revealed that females are more dissatisfied with their thermal environments than males especially in the summer season with high significance, and occupants over 40 years old are more satisfied than under 40 in the cooling season with marginal significance[2]. More extensive debates of the gender effect can be found within thermal comfort literature. Factors such as thermal sensation (or neutrality) and thermal acceptability (or dissatisfaction) have been explicitly addressed. A field research conducted in Japan identified significant differences in thermoneutrality between the two sexes [11], in which the female group registered significantly higher neutral temperature (25.1°C) compared to the male group (22.9°C).

Kim et al.,studied the gender differences in office occupant perception of indoor environmental quality (IEQ) of 38,257 office occupant samples. In this study significant gender differences were observed for mean satisfaction level with all IEQ factors, with females being consistently less satisfied. Female occupants were more critical about the quality of their workspace environment than their male counterparts. Logistic regression analyses conducted on the entire occupant sample showed that being female was significantly associated with IEQ dissatisfaction, particularly with indoor thermal, air quality and workspace cleanliness issues[9].

In India this is a new area of research. Aim of the present research was to study the effect of gender of employee on perceived indoor environment quality and productivity.

2. Methodology

Sample

A total of 600 employees from various offices of Punjab were recruited as sample. The age range of the sample was between 25 to 55 years. The employees who were working for the last three years in a particular organization were considered for inclusion in this study. The minimum educational qualification of the selected subjects was graduation. In the present study sample was divided into two groups Group 1 consisted of 310 male employees and Group II consisted of 290 female employees

Questionnaire

The data collection instrument for this study was a structured questionnaire developed by the researcher with the help of experts. The questionnaire is adapted and modified version of already existing scales of occupants' satisfaction with indoor environment quality (IEQ) components of other buildings by different researchers. The questionnaire items were developed to reflect the satisfaction/comfort/productivity components of the office environment. The questionnaire for the study contained 44 total items pertaining to employees' general demographics and satisfaction with thermal, acoustic, and lighting conditions. The items of the questionnaire were related to the occupants' satisfaction of the IEQ components of thermal, acoustic, and lighting conditions. They were rated by the occupants based on a five-point Likert-type scale (1= "very dissatisfied" to 5 = "very satisfied").

Data analysis

For result findings and in-depth analysis of the different components of office environment on the productivity of the office employees, statistical techniques of t test has been used. SPSS 16 software as research tool for data analysis was used for this research.

3. Results and Discussion

According to the sample data collected, percent samples employees were female 48.34 and percent employees were male 51.66.. Feedback of overall samples according to the gender and the mean of different variables and productivity of female and male respondents are detailed in Table 1.

Table 1.Significance of Mean Difference in Scores of Office Design Components between Male (N=310) and Female (N=290) Employees

Variable	Gender	N	Mean	Std. Deviation	t
Furniture	F	310	3.1190	.71044	-0.8
	M	290	3.1576	.73711	
Noise	F	310	2.8652	.56984	1.1
	M	290	2.8689	.57107	
Temperature	F	310	2.9999	.42169	-4.57**
	M	290	3.1555	.47149	
Lighting	F	310	2.8877	.76660	-1.31
	M	290	2.9664	.76556	
Spatial Arrangement	F	310	3.1444	.72529	-0.016
	M	290	3.1320	.78921	
View Window	F	310	2.7878	.80342	.066
	M	290	2.7831	.81038	
Nature Plants	F	310	2.6766	.84604	-.298
	M	290	2.6577	.83142	
Productivity	F	310	3.8010	.74224	3.33**
	M	290	3.6009	.74754	

** Significant at .01 level

In the present study was undertaken to see gender difference on few of the indoor environment variables in Punjab. It was observed that significant gender differences were found on satisfaction with the office temperature. Male employees were found to be more satisfied with their temperature as compared to their female counterparts. These findings corroborate the findings of previously published field research from west. Women have previously been reported as being less satisfied with indoor thermal environment [3][1][4][8][2][9].

Differences between the thermal comfort responses of females and males in field studies have sometimes been attributed to clothing differences between the sexes. Furthermore, local discomfort resulting from greater clothing insulation variability among female office workers might have contributed to the higher levels of thermal unacceptability for females in the current study. A laboratory experiment that found a high correlation between the whole-body thermal sensation and local thermal sensation among females tends to support this argument. McNall et al.,that females have

a lower metabolic rate per unit surface area under sedentary activity than males[10]. Physiological differences between the two sexes may have an influence on their thermal responses. In their review article Stocks et al., concluded that the menstrual and other regulatory hormones affected thermal comfort responses, thermoregulation and thermogenic thresholds of females[12]. Havenith and Middendorps' laboratory study suggested that gender differences in physiological responses to heat stress in warm-humid and hot-dry exposures can be attributed to factors such as percentage of body fat and the surface-to-mass ratio[6]. In relation to females' sensitivity to indoor air quality problems or health symptoms, some researchers infer that the reason may be due to differences in hormonal levels giving different psychosocial thresholds for the stimuli. Golja et al., observed just noticeable skin temperature thresholds by directly stimulating subjects' forearms. Their experimental study demonstrated that females had a significantly smaller skin temperature threshold for cool sensations to be noticed (0.3K and 0.7K cooler than adapted temperature for female and male subjects respectively). Likewise on the warm side, females reported warm sensations when skin temperature rose 0.7K above adapted temperature, compared to 1.2K for male subjects. These findings led Golja et al., to conclude that women are more sensitive to cold and warm conditions than men[5].

4. Conclusion

The present study also supported the general consensus that gender differences exist, particularly in building thermal discomfort. So it is imperative that we pay utmost attention to needs of female employees to achieve optimal level of effective productivity in offices

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