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An Aging Workforce and Work Environment: A Hotel Case Study in China

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ABSTRACT

The demographic trends of decreasing fertility rate and increasing life expectancy result in many older people remaining in the workforce. The biggest challenge for organizations is to establish a productive and safe working environment for their aging workers as their physical and cognitive capabilities decrease. The physical environment can influence workers' productivity, well-being, and safety. First, this study provides a literature review on how older workers' physical and cognitive conditions change. Second, a survey was conducted with older employees in a hotel located in Xi'an, China to understand the older employees' job satisfaction level, current diseases, possible reasons for their diseases or low productivity at work, and their preference on the future workspace. Lastly, this paper suggests several workplace strategies including ergonomic design in the workspace, flexible office layout, and improvement of indoor air quality to support the aging workforce with their working environment. Besides, the method can be used by other similar organizations to understand their aging employees' concerns and needs and to inform how to design the workplace for the aging employees.

Keywords: Aging workforce, physical and psychological change, physical environment, work environment

INTRODUCTION

The aging population has become a common problem worldwide because of improved life expectancy and low fertility rate (Bloom et al., 2011). In China, the age distribution of the population changed from a pyramid dominated by young population to the elderly and middle-aged (Yang & Meiyan, 2010). It was mainly due to the "one-child policy" which was introduced in 1980 as well as the government's encouragement of late marriage (Yang & Meiyan, 2010). According to the United Nations, the process of population aging is defined as "an increasing proportion of older persons in a population" especially when the proportion of people aged 60 and over account more than those aged 15 and under (United Nations, 2015). Notably, the pace of growth of the older population aged 60 and over is higher than any other age group globally, and it increases the total dependency ratio of childhood and old age to the working-aged group through not only family financial support but also public transfer programs (United Nations, 2015). Corresponding to the fifth census in 2000, China's population over the age of 60 years old accounted for 7 percent of the entire population. It was a fast growth considering 3.6 percent in 1964. In 2015, individuals 60 years of age and over reached 16.1 percent (National Bureau of Statistics of China, 2017). This figure indicated that China started moving into an aging society. According to the Age Discrimination in Employment Act of 1967 (Pub. L. 90-202) (ADEA) in the U.S., the aging workforce is the working individual who is 40 and older due to their physical and cognitive deterioration (Bockman & Sirotnik, 2008). This paper will refer to ADEA and consider individuals who are 40 and older as older (aging) workers.

As the aging population grows, the Chinese government has started to delay the retirement age (BBC Chinese Website, 2015). The aging population is also willing to work beyond retirement age for their living needs. Companies prefer keeping the aging workforce because these employees are loyal, self-sacrificing, and more skilled and experienced (Lowe et al., 2008). They can help companies by mentoring and training the younger generations. However, physical and cognitive functions of a human body deteriorate with age. Older workers are more vulnerable to getting injured because of porous bones, and it takes longer for them to recover. Therefore, company owners should pay more attention to improving the physical environment for the aging employees' productivity, safety, and well-being (Harrington & Heidkamp, 2013).

Muscle function decreases and reaction time increases as a person ages (Janssen & Verhaar, 2002). People gradually lose strength, balance, VO_2 max (maximal oxygen consumption), bone density, vision, hearing, manual dexterity, and tactile feedback, and become more susceptible to illness because of reduced production and effectiveness of white blood cells (Silverstein, 2008). Millanvoye's study shows that people lose 5 percent of their strength when they age 20. And until 55, they lose at least 20 percent of power (Millanvoye, 1998). Generally, employees tend to have some chronic diseases which may cause physiological changes including oxygen intake, respiratory system, fatigue, and higher susceptibility to extreme temperatures, obesity, and hyperlipemia changes (Perry, 2010). Besides, when people get old, their psychological conditions start to

change including emotional well-being (i.e., anxiety, stress, depression, energy, fatigue, and optimism) and self-perceptions (i.e., self-efficacy, self-worth, self-esteem, and locus of control) (Netz et al. 2005). Older employees have already stayed in their career for a long time, and they are familiar with their tasks. It is not uncommon to find that aging workers are not as interested in learning new technologies and skills (Doering et al., 1983; Heron & Grown, 1961). This generation is also greatly concerned about their status in the office (Lowe et al., 2008). If the company or the owner ask them to take the training courses, it might hurt their self-esteem and make them feel stressed (Czaja & Sharit, 1998).

Although China's population is aging rapidly and more people work beyond their retirement age, there is not enough research focusing on the needs of the aging workforce regarding their workplace. This study investigates a hotel case study to understand the environmental needs of older employees, which can ultimately benefit a hotel owner, managerial staff, and workers. Understanding what aging workers need is critical before renovating the work environment or purchasing supportive technology or products. Considering the working population in the hotel industry is also aging, the case study in this paper can provide some insights on environmental requirements and concerns for the aging workforce.

BACKGROUND INFORMATION: A HOTEL CASE STUDY

The hotel in this case study used to be popular for its excellent location and traditional architectural style. It is located in Xi'an China and was established in 1990. The hotel is near the center of the city and is surrounded by historical sites such as the Bell Tower and the Drum Tower. However, the hotel's operating condition is not ideal due to age, improper management style, and lack of awareness of improving aging employees' work performance (CEO of the hotel, interview, November 11th, 2016). According to the owner's documentation, a total of 110 employees work in 9 departments in this hotel. People who are 40 and older consist of 57 percent of the total employees (63/110). Among these aging employees, 66.7 percent are general laborers (i.e., front desk, food and beverage, housekeeping) and 33.3 percent are responsible for the regular management and office work (i.e., accounting and procurement). The ratio of males and females is 44.8 percent to 55.2 percent. Besides, over 68.3 percent of the aging employees have worked at this hotel over 10 years. It is vital to understand these employees' needs regarding the physical environment since more than half of the total employees are older workers and have been working and are expected to work at this hotel for a long time.

METHODS

This study was carried out in a four-star hotel in Xi'an, China focusing on the suitable working environment for aging workforce. The researchers contacted the CEO to request this research. The case study involved a paper-based survey and semi-structured face-to-face interviews with the older workers in the hotel to understand their concerns regarding the work environment. There were a total of 110 employees in this hotel, and 63 of them were aging workforce. The aging employees in the hotel were divided into two groups based on their job functions, office staff and general workers, in order to understand their physical conditions and preferences which might be affected by types of work. Each survey was distributed directly to individuals onsite to ensure the accuracy and efficacy of data and feedback. The survey consisted of three parts and 17 items: 1) demographic information of the respondents including their age, gender, and department, 2) employees' daily job functions, current work environment conditions, and their satisfaction level about the work environment, and 3) physical, physiological, and psychological conditions and their particular perception of the workplace. Several survey questions asked the types of disease that the aging workforce had, the aging employees' overall satisfaction level about their work environment, the average hours of working on a computer per day, the relationship between the physical environment and productivity, whether they were able to work efficiently within the current environment or not, the aspects of the work environment that they wished to be improved, and whether the company updated and shared information about how to prevent injuries at work. Most of the survey items required the respondents to select the closest condition according to their experience using a Semantic Differential scale. Some of the items were using a Likert scale which required respondents to select from "strongly disagree" to "strongly agree."

Additionally, the semi-structured face-to-face interviews were conducted with the CEO of the hotel, three office staff (accounting and procurement departments), and three general labor employees (cleaning, food and beverage, and service) to understand their concerns and needs regarding their work environment. The interview questions mainly focused on the further explanation of the survey result. This 20-minute face-to-face interview included questions such as the current work environment condition, reasons why the poor work environment resulted in physical, physiological, and psychological issues including periarthritis humeroscapularis (PHS) and depression problems, their particular needs in the workplace including what aspects they liked the most for the current work environment and what aspects they thought the least favorable, and whether they believed their productivity would be improved in a more desirable work environment. As there were limitations and difficulties, a descriptive analysis method has been selected for most data analysis. All of the survey questions were translated into Chinese, and then the answers were translated back in English.

TABLE 1.—Work Environment Satisfaction (Group Statistics)

	N	Mean	Std. Deviation	Std. Error Mean
Office Staff	21	2.81	.750	.164
General Labor	42	3.21	.717	.111

RESULTS

A total of 63 responses were collected: 21 from office staff and 42 from general workers. The response rate for the office staff and general workers were both 100 percent. Table 1 and 2 illustrate the level of environmental satisfaction among the aging workers. According to the independent samples test, there was a significant difference in attitude toward the working environment between general laborers and office staff - employees with general labor work were more satisfied with their work environment than office staff (p-value=0.042, Table 2).

Table 3 illustrates the average time that the aging workforce worked on the computer per day: 80.9 percent of the office staff used the computer over 4 hours per day. Spending more time on the computer increases the likelihood of having neck or shoulder and hand or arm musculoskeletal symptoms and disorders (Gerr, Marcus, Kleinbaum, Cohen, Edwards, Gentry, Ortiz, & Monteilh, 2002). Thus, having ergonomic furniture and equipment such as adjustable desks and ergonomic keyboards would be helpful to prevent the possible problems associated with using the computer for a long stretch of time.

Based on the literature review of physical, physiological, and psychological changes with aging, this paper investigated self-reported diseases among the aging employees (Table 4). The top three common diseases for general laborers and office staff were similar but had a subtle difference. Specifically, among all the statements of diseases, asthenopia (eye strain), cervical spondylosis (age-related wear and tear of the spinal disks), and PHS (stiffness and pain in the shoulder joint) were perceived as the three most common diseases for the general labor employees, 57.1, 47.6, and 40.5 percent, respectively. For the office staff, cervical spondylosis, asthenopia, and PHS were the top three problems accounting for 81.0, 76.2, and 42.9 percent of cases. Moreover, depression and dysphoria (feeling very unhappy, uneasy, or dissatisfied) problems also appeared for both office staff and general laborers, which implies that psychological changes should not be ignored.

Table 5 shows what employees thought contributed to their chronic illness: 81.0 percent of the office staff and 76.2 percent of the general laborers considered that limited activity space, such as enclosed office layout and no exercise room, affected their health and work performance. Besides, noise, heavy workload, and long hours of work might make these older workers feel stressed out, physically and psychologically. Moreover, long working hours can cause asthenopia, PHS, and cervical problems (Spurgeon, Harrington & Cooper, 1997). In addition, the lack of a healthcare center, and unhealthy food service in the café were reported as contributing factors to employees' reduced performance and well-being.

Table 6 shows employees' opinions about the relationship between diseases and the work environment. Corresponding to each poor work environment factor, the top two diseases were selected by employees. Accordingly, these aging workforce believed that physical problems, such as PHS, cervical spondylosis, and tenosynovitis (inflammation of the tendon sheath) were mainly due to limited activity space, heavy workload, and long work hours. Psychological change including depression and ahypnosis resulted from noise, heavy workload, and long work hours.

Table 7 shows that 73.8 percent of the general laborers and 42.9 percent of the office staff wish to have a lounge area where they can take a break. Indoor air quality was another important factor that many of the aging workers were concerned about (76.2 percent of the office staff and 57.1 percent of the general laborers). Since the workers needed to stay in the building for the whole working day, indoor air quality was considered an important factor. Besides, both office staff (71.4 percent) and general laborers (52.4 percent) believed that a clean work environment would help them improve productivity. Among office staff, 61.9 percent responded that lack of natural light and greenery made them feel more tired. They viewed natural light as another aspect for redesigning the workplace. In addition, flexible layout of the workspace, café, exercise room, and healthcare center were also desired. Notably, there were 66.7 percent of the office staff and 45.2 percent general laborers who wished to have ergonomic furniture and office equipment in their workspace because they needed to work and use the computer for a long time.

From the interviews, the employees believed that it would be beneficial for both office staff and general laborers if the company could reduce the number of working hours and provide frequent breaks throughout the day. According to the CEO's statement, the heating, ventilation and air

TABLE 2.—Work Environment Satisfaction (Independent Samples Test)

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal Variances Assumed	.013	.909	-2.081	61	.042	-.405	.195	-.794	-.016
Equal Variances not Assumed			-2.050	38.543	.047	-.405	.197	-.804	-.005

TABLE 3.—The Average Time of Using Computers Per Day

	Office Staff			General Labor		
	Below 4 Hours	4-6 Hours	Above 6 Hours	Below 4 Hours	4-6 Hours	Above 6 Hours
Frequency	4	7	10	25	15	2
Percent	19.0%	33.3%	47.6%	59.5%	35.7%	4.8%

TABLE 4.—Self-reported Disease of Aging Workforce

	Office Staff Response (n=21)			General Labor Response (n=42)		
	Responses			Responses		
Diseases	**N**	**Percent**	**Percent**	**N**	**Percent**	**Percent**
Periarthritis Humeroscapularis	9	11.4%	42.9%	17	13.6%	40.5%
Cervical Spondylosis	17	21.5%	81.0%	20	16.0%	47.6%
Asthenopia	16	20.3%	76.2%	24	19.2%	57.1%
Dysphoria	8	10.1%	38.1%	15	12.0%	35.7%
Ahypnosis	5	6.3%	23.8%	14	11.2%	33.3%
Hyperlipemia	2	2.5%	9.5%	2	1.6%	4.8%
Hyperglycemia	2	2.5%	9.5%	1	0.8%	2.4%
Gastrointestinal Disease	3	3.8%	14.3%	10	8.0%	23.8%
Obesity	4	5.1%	19.0%	5	4.0%	11.9%
Tenosynovitis	3	3.8%	14.3%	7	5.6%	16.7%
Fatty Liver	4	5.1%	19.0%	5	4.0%	11.9%
Depression	6	7.6%	28.6%	5	4.0%	11.9%
Total	79	100%		125	100%	

conditioning (HVAC) system in the hotel was not in an ideal condition and the company was considering changing the HVAC system to meet their employees' needs on indoor air quality (CEO of the hotel, interview, November 11th, 2016).

DISCUSSION

The results of the survey corresponded to the literature review. The literature mainly discussed that the aging workers' condition deteriorated in three aspects, physical, physiological, and psychological changes. According to the survey from the hotel case study in Xi'an, China, the aging workers responded that their physical challenges mainly were related to periarthritis humeroscapularis, cervical spondylosis, asthenopia, and tenosynovitis. These physical challenges corresponded to limited activity space, heavy workload, and long work hours. They also suffered from psychological problems such as depression and dysphoria. It reflects how their psychological condition changes. Based on the descriptive statistic, these aging workers believed that the uncomfortable environment would result in higher chances of getting injured or having a chronic disease. Furthermore, suffering from diseases distracts employees' attention from their job functions and increases absenteeism and presenteeism (Caverley et al., 2007).

Corresponding to the results of the survey, the company should realize the importance of improving the work environment condition for helping older workers work in a safe and productive environment. Several environmental design strategies are suggested for the owner to consider. First, ergonomic furniture can be an adequate healthy support for the aging workforce, especially for office staff who need to use computers for a long time (Streb et al., 2008). Second, an open and flexible space layout with a dedicated break area is preferred by aging workforce. Third, as the literature and survey result indicated, one of the common issues of an aging workforce is decreased vision. Providing more natural light, such as using French windows and doors, can mitigate employees' asthenopia problem. In addition, a healthcare center cannot be ignored, which could offer a sphygmomanometer (an instrument for measuring blood pressure) which can help older workers monitor their health condition. Managing indoor air quality is also important because employees are more susceptible to illness with poor indoor air quality (Burge, 2004). The common office indoor air pollutants are chemicals released from a modern building, furniture materials, chemicals from cleaning products, and chemical fumes from plants and solvents (Fanger et al., 1988). The owner can use air purifiers to decrease the risk of having respiratory system problems. Besides all the strategies that are related to the interior design and physical work environment, an objective assessment of work intensification, both long work hours (extensive work intensification) and greater work effort during the time spent (intensive work intensification), should be addressed by management (Green, 2001).

This research has some limitations. The items in the survey were based on the literature which made opinions and selections limited. Besides, the correlation among responses was not clear because the survey had too many "check all that apply" questions. It is important to note that the determination of which aspects of the environment

TABLE 5.—Contributing Factors for Disease and Low Productivity

	Limited Activity Space	Noise	Over-work	Unhealthy Food in Café	No Health-care Center	Over-time	Others	Total
Office Staff								
Count	17	17	12	6	4	13	2	21
%	81.0%	81.0%	57.1%	28.6%	19.0%	61.9%	9.5%	-
General Labor								
Count	32	22	24	11	10	14	3	42
%	76.2%	52.4%	57.1%	26.2%	23.8%	33.3%	7.1%	-
Total								
Count	49	39	36	17	14	27	5	63

TABLE 6.—The Relationship between Diseases and Work Environment

	Diseases	Office Staff	General Labor
Limited Activity Space	Periarthritis Humeroscapularis	61.9%	59.5%
	Cervical Spondylosis	66.7%	64.3%
Noise	Dysphoria	61.9%	59.5%
	Ahypnosis	66.7%	54.8%
Overwork	Asthenopia	85.7%	42.9%
	Cervical Spondylosis	90.5%	45.2%
Unhealthy Food in Café	Hyperlipemia	76.2%	64.3%
	Hyperglycemia	71.4%	47.6%
No Healthcare Center	Gastrointestinal Disease	47.6%	16.7%
	Tenosynovitis	14.3%	28.6%
Overtime	Asthenopia	95.2%	31.0%
	Periarthritis Humeroscapularis	81.0%	42.9%

TABLE 7.—Aging Employees' Preference on Workplace Redesign

Work Environment Factors	Office Staff Responses			General Labor Responses		
	Responses			Responses		
	N	Percent	Percent	N	Percent	Percent
Indoor Air Quality	16	14.7%	76.2%	24	11.5%	57.1%
Workspace Cleanliness	15	13.8%	71.4%	22	10.5%	52.4%
Healthcare Center	4	3.7%	19.0%	10	4.8%	23.8%
Lounge	9	8.3%	42.9%	31	14.8%	73.8%
Lighting	13	11.9%	61.9%	8	3.8%	19.0%
Healthy Food Supply	9	8.3%	42.9%	24	11.5%	57.1%
Café	5	4.6%	23.8%	17	8.1%	40.5%
Ergonomic Furniture	14	12.8%	66.7%	19	9.1%	45.2%
Exercise Room	9	8.3%	42.9%	25	12.0%	59.5%
Flexible Layout of Office	13	11.9%	61.9%	20	9.6%	47.6%
Transportation	2	1.8%	9.5%	9	4.3%	31.4%
Total	109	100%		209	100%	

would result in which specific diseases was only based upon the employees own experience and opinions. Also, their chronic disease or illnesses might have resulted from their previous employment. In order to address the limitations of this hotel case study, it would be effective to utilize objective measures along with employee self-report. Also, because a survey collects data at a single point in time, some further feedback should be obtained after introducing any intervention in the work environment. Although this case study cannot address a conclusive relationship between the work environment and employees' physical and mental health, it shows the current status of aging workers' work environment satisfaction as well as their current health issues. Thus, it still can be an example for other similar organizations to understand their older employees' concerns and needs regarding their work environment.

CONCLUSION

Due to rapidly changing demographic trends, an aging workforce becomes a big challenge not only for society but also for organizations. Retaining these older workers in the workplace is still necessary because of their experience, skills, and accumulated knowledge. They are valuable assets to the company. However, aging workers' physical and psychological conditions decrease which may also decrease their performance and productivity without proper adjustments in the workplace. Thus, it is time for companies to pay attention to establish a safe and supporting environment for aging workers. The findings of this hotel case study indicate that aging workers, both office staff and general laborers, had similar needs for the physical environment. They are all concerned about whether the company could provide a safe and supportive environment. Within a comfortable and suitable workplace, older employees can be more productive and remain in the workforce longer, which can ultimately benefit an employer. Understanding the employees' needs can help the decision-maker determine priorities in improving the work environment based on the sense of urgency and the magnitude of the impact. Lastly, the older employees' desired work environment can benefit not only themselves but also employees of all ages.

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