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Effect of Sick Building Syndrome on fatigue and runny nose

Hamid Kasnavi Yazdi[1], Narjes Safari[2]

[1,2]Young Researchers and Elite Club, Torbat-e-heydarieh Branch, Islamic Azad University, Torbat-e-heydarieh, Iran

ABSTRACT

There have been few longitudinal studies on sick building syndrome (SBS), which include headache, fatigue, and runny nose. We considered effect of sick building syndrome with illnesses like headache, fatigue and runny nose. Thus, we designed a questionnaire and asked from male of dormitory residence. Questions of the questionnaire were more about known symptoms of buildings (headache, fatigue, and runny nose). Following, we divided lifetime to 3 periods (6 am-2pm; 2pm-10pm and 10pm-6am) and our target places for asking questions in the questionnaire were corridors, rooms, Toilets, kitchen, upper class, almost everywhere and results indicated that significant relationship exists between headache, fatigue and runny nose with sick building syndrome. Other things should be mentioned that is some equipment and devices which students use of them like (Personal computer, copier, printer, gas cookers) at least 10% of their time can be effective on prevalence of the symptoms.

Key words: Fatigue, Sick Building Syndrome, Neurological Signs, WHO

INTRODUCTION

There is concern about various health effects of the indoor environment, including increased prevalence of a variety of non-specific symptoms often described as sick building syndrome (SBS) (WHO, 1983). The term SBS has been used to describe symptoms (including headaches, fatigue, and irritation in the upper respiratory tract, nose, throat, eyes, hands and/or facial skin) that can be influenced by the indoor environment (Redlich et al., 1997; WHO, 1983). Factors reported to be related to SBS include indoor chemical air contaminants, low ventilation rate, female gender, personality trait, and work stress (Burge, 2004; Hansen et al., 2008; Runeson et al., 2004; Takigawa et al., 2009). Moreover, building dampness and exposure to microbial components from molds and bacteria have been the focus with regard to both SBS and asthma (Fung and Hughson, 2003; Hardin et al., 2003; WHO, 2009). It has been concluded that there is sufficient evidence to show that the occupants of damp or moldy buildings have an increased risk of respiratory symptoms and SBS (WHO, 2009). Dormitories are one of the most important environments for students, and there is evidence that the indoor air quality (IAQ) and ventilation in school buildings may affect their health (Daisey et al., 2003), however, we have found few publications on associations between building dampness and measured microbial exposure in schools or about SBS in school children

Corresponding Author E-mail: Kasnavihamid@gmail.com

(Meyer et al., 2004; Saijo et al., 2010). Indoor microbial contaminants include bacteria, molds, yeast, and various components from these organisms. The most studied bacterial compound is endotoxin (LPS) (Seltzer, 1995). Endotoxins are integral components of the outer membrane of Gram-negative bacteria, and LPS is responsible for most of the immunological properties of bacterial endotoxins (WHO, 2009). Muramic acid (MuA) is a cell wall compound found in all bacteria, but since the walls of Gram-positive bacteria are much thicker than those of Gram-negative bacteria, it is considered to be mainly an indicator of Gram-positive bacteria (Sebastian et al., 2004). Ergosterol (Erg) and beta-1-3-glucane are cell wall compounds found in fungi (Rylander, 2004; Saraf et al., 1997). Moreover, analysis of fungal DNA by quantitative PCR (qPCR) has recently been applied in epidemiological studies on asthma in relation to mold exposure in homes (Vesper et al., 2007) and schools (Cai et al., 2011).

Importance of research

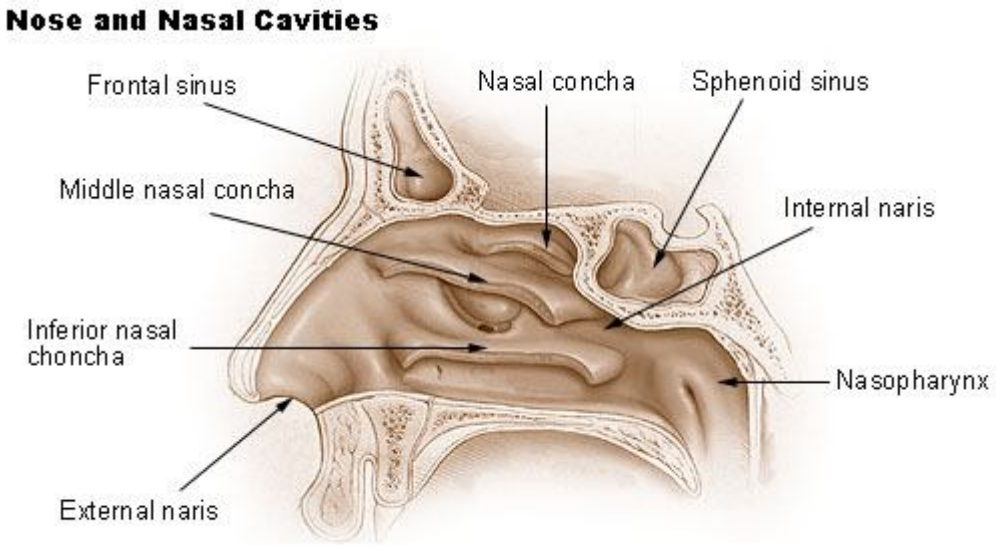
We should pay special attention to sick building syndrome. Since, many of people specially in workplace are facing with the problem. Prevalence of sick building syndrome evaluates approximately 20%. World health organization believe sign and symptoms of irritant for skin and mucous membranes, headaches, fatigue, difficulty concentrating of clerks in modern buildings is sick building syndrome. Moreover, sick building syndrome is wide reason of absence of clerks and reduction of production and returns.

In according to more beneficial time of clerks have been spent in buildings, therefore, investigate health position and respiratory air is important. Thus, pay attention to indoor pollutant is necessary. Since, by creating proper ventilation conditions and improvement of current job opportunities can provide ideal position and increase job returns and decrease absence of clerks.

Related problems of indoor air quality in unmanufactured buildings include a series of nonspecific symptoms. They have unknown reason, however, it is possible to show these symptoms (signs) more in somewhere. The most known symptoms are neurological signs, respiratory, mucosal irritation, or irritation of eyes, throat, and nose and so on (Hodgson and Adorisio, 2005; Samet and et al, 1998)

Runny nose

Rhinorrhea (runny nose) is characterized by an excess amount of mucus produced by the mucous membranes that line the nasal cavities. The membranes create mucus faster than it can be processed, causing a backup of mucus in the nasal cavities. As the cavity fills up, it blocks off the air passageway, causing difficulty breathing through the nose. Air caught in nasal cavities, namely the sinus cavities, cannot be released and the resulting pressure may cause a headache or facial pain. If the sinus passage remains blocked, there is a chance that sinusitis may result. If the mucus backs up through the Eustachian tube, it may result in ear pain or an ear infection. Excess mucus accumulating in the throat or back of the nose may cause a post-nasal drip, resulting in a sore throat or coughing. Additional symptoms include sneezing, nosebleeds, and nasal discharge.



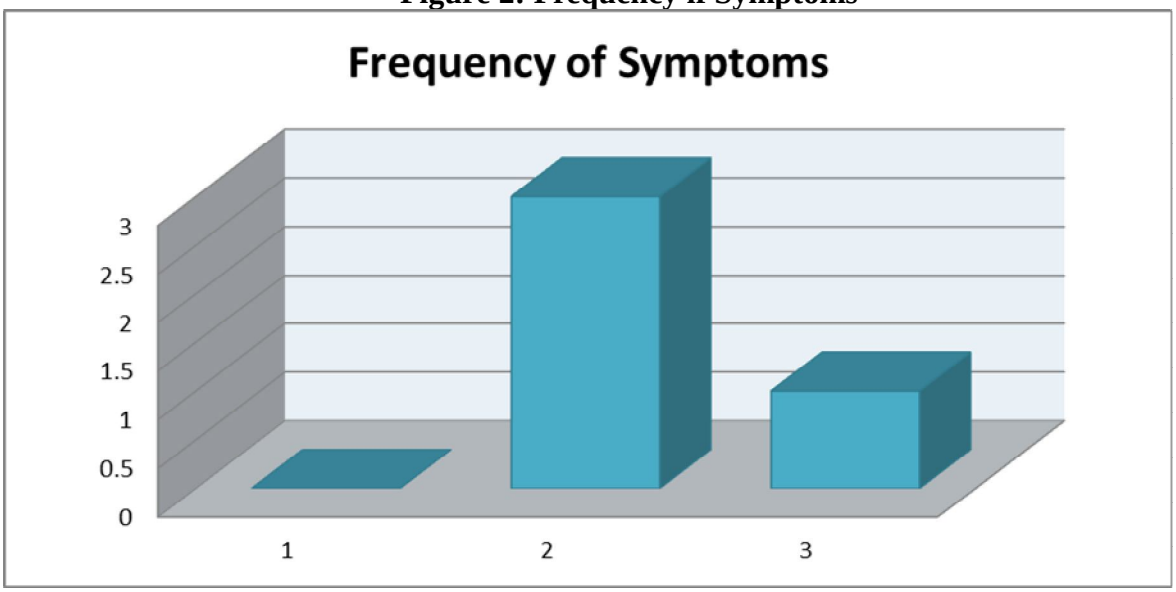
Methodology

This study did in dormitory of Tehran University in 2011. This dormitory includes 13 buildings and is located in high value of traffic and pollution of cars has essential role in pollution of this dormitory. Furthermore, dormitory is the biggest dormitory in Middle East and large population of students placed in this dormitory. Thus, we asked from 340 student of this dormitory randomly and the questionnaire includes ask about symptoms of neurological symptoms and existence and absence of air condition had vital role in the questionnaire. Additionally, we asked some additional factors in order to study effective factors on sick building syndrome.

Hypotheses

H_1: Significant relationship exists between sick building syndrome (SBS), fatigue, and malaise
H_2: Significant relationship exists between sick building syndrome (SBS) and runny nose

Figure 2: Frequency if Symptoms



Conclusions and Discussions:

In according to results of the research in among 340 of respondents who all were men; 222 (65%) of respondents were unsatisfied and they accounted as sick building syndrome, whereas, 118 of respondents (35%) were satisfied from air quality of indoor buildings.

In this research, for residence symptoms like malaise and fatigue with 180 people, drowsiness constitutes 166 people, headache includes 110 people, runny nose with 92 people, inflammation, swelling and irritation of the eyes 65 persons and finally asthma constitutes 35 people were the most common problems of residence respectively. We achieved reasonable reasons and documentaries based on, empirical data of the residence and interior condition of rooms, buildings environmental and physical condition and eventually, the most important reasons are as following:

Most of residence believed lack of ventilation system is the first reason of sick building syndrome and it is substantially higher than other problems. Following, 80 people of residence believed noises is the second reason of sick building syndrome. The third reason is contaminated materials like carpets, detergents, bacteria and mushrooms, which were approved by 74 people. Then, 73 people believed that fourth reason belongs to cars smoke, steam and cooking smoke, airborne dust. Fifth reason is a symptom in residents is noises (59 people). Finally, 30 respondents believed high humidity is sixth reason of sick building syndrome. The most important places for severity of symptoms are in rooms (131people), toilets (84), corridors (61) almost of everywhere of buildings (53) kitchen (52) and upper floors (14). The most hours exacerbate symptoms between 2pm-10 pm, period time of 6 am- 2pm the second worse symptoms and 10 pm to 6 am is the least hours of symptoms in among residence. Eventually, another factor that can be cited existence tools and equipments which residence use of them more than 10% of their time, they

play role in creating sick building syndrome symptoms, and in among these equipments personal computer has the most important role. Meanwhile, using gas cookers, use of copiers and printers have substantial less important role for creating sick building syndrome.

All symptoms may be due to insomnia, Scleritis, mental health problems. Other factors like material of construction, age of building, high humidity, fluctuation of temperature, high artificial light, color and isolation of the building, crowded city, pollutant carpets, plates.

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