REDUCING ELEVATOR USE THROUGH ENERGY CONSERVATION TRIVIA

Jessa Mae Allejos, Marie Katherine Mejia, Precious Cindy Ventura and Enrico C. Garcia

Lyceum of the Philippines University-Laguna

ABSTRACT

The study aims to identify the demographic profile of the respondents in terms of age, gender, college, and body structure, to determine the perception of the respondents in the energy conservation trivia in reducing elevator use and to determine the correlation between demographic profile and respondents' perception on energy conservation trivia in reducing elevator use. The study used descriptive-correlational method. Twelve statement was provided as Energy Conservation Trivia which derived from several references, particularly those applicable in reducing elevator use. The twelve statement that emphasized energy conservation trivia in reducing elevator used gave an overall weighted mean of 1.79, interpreted as "agree". Correlation analyses revelead that age, with correlation coefficient of -.013 has a negligible correlation to energy conservation trivia in reducing elevator use. The perception of respondents' in the energy conservation triva in reducing elevator use were all correlated with other demographic profile. Gender, with a correlation coefficient of -.422, interpreted as moderate correlation, College with -.0753, interpreted as high correlation and Body Mass Index, with 0.987 interpreted as high correlation. It was recomended to increase the number of respondents participated in the study. Energy conservation trivia can be posted in a designated area as well as inside the elevator to test weather the energy conservation trivia were effective in reducing elevator use. And include energy conservation in the syllabi of some related courses and make some program in energy conservation were men has been encourage to participate in energy conservation campaign.

***Keywords**: energy conservation trivia, energy conservation campaign, elevator use*

INTRODUCTION

Energy conservation is the reducing of energy consumption through using less of an energy service. It lowers energy cost by preventing future resource depletion. Many countries are promoting energy conservation in different ways. For example, in Sri Lanka, most of the industries are requested to reduce their energy consumption by using renewable energy sources and optimizing their energy usage. In Nigeria, the Lagos State government is encouraging lagosians to imbibe an energy conservation culture. Logos State Electricity board is spearheading an initiative tagged "Conserve Energy, Save Money" (Rogers, 2008). On the other hand, many ways of energy conservation were already practiced in many parts of the worlds. Saving scheme such as using of LED lights rather incandescent, unplugging television set and others devices when not in use as well as using stairs rather elevator were common.

Elevators are convenient in making easy access to different floors of a building. Especially the people who are physically disabled find it very easy for them to move on from one floor to the other. It is also used for carrying heavy materials and goods up and down the building very easily. Similarly, a pregnant woman, an elderly person or with other health problems who is facing difficulties to climb up the stairs would probably take the elevator as a messiah in their lives. (Pezzini, 2010) On the other hand, many people today are using elevators; through it is possible for them not to use elevators. Some used elevators thinking that they could easily get to their place and sometimes, they are just find it tiring to use the stairs. But, according to Norton (2014), if you think you don't have time to take the stairs, you may be out of an excuse. Researchers at one Canadian hospital found that when they had doctors take the stairs instead of elevators it saved each an average of 15 minutes out of the workday. The stairs were more efficient, since there was no wait-time for a lift, according to findings reported in the Canadian Medical Association Journal.

Kinsey and Lawrence (2011) identified that in an average, elevator use contributes greater than 5% of building energy consumption in an hourly basis. From the 10 easy ways you can conserve energy as University of Pennsylvania includes taking stairs instead of elevators advisory. It also revealed that if you were to walk up and down to 3 flights of stairs instead of an elevator it would saving 15 watts a day and that would be enough to power a 37" Plasma TV for 3 hours. Another thing is that elevators run on electricity; taking an elevator might require the mining of uranium or fossil fuel, the operation of a nuclear or fossil fuel plant, and the emission of greenhouse effect. For the last, new evidences shows reduced daily physical

activity is a direct cause of many risk factors for chronic illness like diabetes and cardiovascular disease.Meyer (2010), encouraging stair use at work as it is effective for improving fitness, body composition, blood pressure and lipid profile in asymptomatic individuals with an inactive lifestyle and thus may be a simple way to significantly reduce cardio vascular disease risk at the population level.

Though elevators were built for a good purpose and have its own advantages, still there are disadvantages sides of it. According to Morgan (2014), the disadvantages of elevator are as follows. 1. Stairs are faster – according to the study by students at the University of South Carolina, Aiken, it actually takes about twice as long in average to go from one floor to the next by elevators as it does to walk the stairs the same spot. 2. Promotes laziness – climbing the stairs is a good physical exercise and many people do not get enough exercise as it is. Even if the trip up the stairs is four or five stories, the person who climbs it will get more benefit physically than the lethargic person who stands on the elevator and waits to be effortlessly delivered to his destination. 3. Claustrophobia concern – even if you have not been diagnose as claustrophobia, being in a crowded elevator, and potentially getting stuck for a time in a small, enclosed space, can cause a certain amount of anxiety for an unsuspecting passenger, and last 4. Germs Haven – many people may not consider it, but elevators are among the most germ-infested places around, according to sixwise.com. Many fingers press the buttons inside the elevators between cleaning – if they cleaned at all. Using hand sanitizer or hand wipes with a sanitizing solution can decrease chances of picking up germs in the elevator.

Reducing elevator use as a medium in energy conservation is beneficial not only to the environment but also in lowering energy cost and every individual's health. A useful energy trivia can be use as a tool in improving knowledge and attitude of people on how to conserve energy. As (Mitra, 2012) emphasized multiple health benefits of using stairs, desimination of information through trivia can be a great idea to encourage people to use stairs rather than the elevator. Another factors that this study wants to identify were the relationship of gender and course/program differences in the effectivity of the energy conservation trivia in reducing their use of elevator. This was related on the findings of (Mitra, 2012) that gender and profession maybe factor wheather energy conservation campaign was effective or not. Moreover, the BMI or body structure of individuals as well as their age were also subject for correlation.

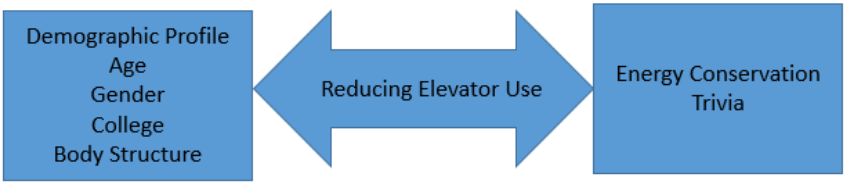

Figure 1. Conceptual Framework

Figure 1 shows the factor in reducing elevator use. The arrow on both sides emphasized the correlation between the demographic profile and the perception of the respondents in the energy conservation trivia in reducing elevator use.

Objectives of the Study

The study aims to (1) identify the demographic profile of the respondents in terms of age, gender, college, and body structure (2) determine the perception of the respondents in the energy conservation trivia in reducing elevator use and (3) determine the correlation between demographic profile and respondents' perception on energy conservation trivia in reducing elevator use.

METHODOLOGY

The study used descriptive-correlational method. Twelve statement was provided as Energy Conservation Trivia which derived from several references, particularly those applicable in reducing elevator use. Random sampling were used as well as G-Power software in determining the sample size. The gathered data were tabulated using excel. Frequency and percentages were used for the demographic profile of the respondents. Weighted Mean were to determine the perception of the respondents' on energy conservation trivia in reducing elevator used. And finally, point biserial correlation analysis were determine the correlation between the demographic profile and the respondents perception on the environmental trivia in reducing elevator used. All data were run in SPSS computer software.

RESULTS AND DISCUSSION

Demographic Profile of the Respondents

Table 1. Distribution of respondents according to age

Age	Frequency	Percentage
16	11	26.19%
17	8	19.04%
18	6	14.29%
19	8	19.04%
20	6	14.29%
21	1	2.38%
22	2	4.77%
Total	42	100.00%

The respondents' ages were around 16-22 age bracket. 26% percent of the respondents were freshmen students while the rest of the respondents still belong to post-teenage individuals. (Kinsey et.al. 2011) stated that the post-teenage individuals were tend to use the elevators rather than the stairs because they considered the elevator area as a place to make fun.

Table 2. Distribution of respondents according to gender

Gender	Frequency	Percent
Male	15	36%
Female	27	64%
Total	42	100%

Majority of the respondents were female (64%) considering that they were mostly willing to answer the trivia questions when the time of random sampling procedures. Consequently, (French et.al. 2010) on their study of "Environmental Influences on Eating and Physical Activity", women are most likely to participate because of their high level consciousness about fitness.

Table 3. Distribution of respondents' College

College	Frequency	Percent
CITHM	10	43%
CAS	3	7%
CBA	3	7%

COECS	12	29%
CAM	6	14%
Total	42	100%

Among the respondents, 43% were computed as representative population for the College of International, 29% for College or Engineering and Computer Science, 14% for College of Allied Medicine, and both 7% for College of Business and Accountancy and College of Arts and Sciences.

Table 4. Distribution of respondents' Body Structure

Body Mass Index	Frequency	Percentage
Underweight	6	14%
Normal	33	79%
Overweight	2	5%
Obese	1	2%
Total	42	100

Mostly of the respondents were categorized in the normal body mass index level (33%). Respondents' height and weight were identified to calculate their body mass index. The general formula for body mass index: weight in pounds multiply by 704.2 divided by square of their height in inches were used. (Blamey et.al. 1995) used the body mass index as a factor in their study to analyzing respondents' cooperation in the health promotion by encouraged use of stairs.

Respondents' perception on energy conservation trivia in reducing elevator use

The twelve statement presenting on table 5 were collected from various energy conservation studies and used as energy conservation trivia in reducing elevator use.

Table 5. Weighted mean of Energy Conservation Trivia in reducing elevator use.

Trivia	Weighted Mean	Interpretation
1. Climbing just two flights of stairs everyday could result a loss of 2.7 kg or 6 lbs per year. Six flights a day could help you trim nearly 18 lbs.	1.74	Agree
2. Adding stairs to your day can add years to your	1.69	Agree

life. Studies show that risk of cardiovascular disease and death is lower among those who are regular stair climbers.		
3. Those who climb stairs on a daily basis have greater leg strength and aerobic capacity, allowing them to participate more fully in a wide range of daily activities.	1.52	Agree
4. Using the stairs can burn twice as many calories as walking.	1.57	Agree
5. Just 2 minutes of climbing stairs a day can keep off the pesky 2 lbs that most adults gain in a year.	2.07	Agree
6. Taking the stairs firms up your glutes and quadriceps while increasing your bone density.	1.88	Agree
7. While climbing stairs, you're burning an average of 10 calories a minute! That's 7x more calories a minute than standing in an elevator.	1.79	Agree
8. According to a study done at Harvard university, if you can fit in 8 flights of stairs a day you could reduce your death rate by 32%.	1.88	Agree
9. Stepping on each stair with your entire foot can help prevent injury and straining of your Achilles tendon	1.74	Agree
10. A British study states that 11 minutes a day spent climbing stairs at "a brisk but comfortable" pace will not only burn calories and improve your cardiovascular endurance, it will also help lower your LDL cholesterol level (that's the bad one).	1.76	Agree
11. If you have bad knees, whether it be arthritis or something else, try taking the stairs up and then take the elevator down	2.21	Agree
12. Elevators are among the most germ-infested places around, according to Sixwise.com. Not only are passengers in an elevator locked in an enclosed space with potentially contagious people sneezing or coughing, but the buttons are a minefield of germs.	1.64	Agree
Over all weighted mean	**1.79**	**Agree**

Legend: 4-Strongly Disagree, 3-Disagree, 2-Agree and 1-Strongly Agree.

An average of 1.79, interpreted as agree were analyzed. Although, all statement were greater than 1.50 and in less than 2.00 bracket, respondents still believed that using stairs rather than elevator was good for their health and energy conservation. (Norton 2011) found out that using

scientific information in promoting healthy lifestyle were effective as a tool to encourage people in certain companies to practice healthy lifestyle by using stairs rather elevator or escalator. In addition, saving energy were observed in the study sites were employees' activities of using elevator were monitored.

Correlation Analysis

Table 6. Correlation analysis of the demographic profile and respondents' perception on energy conservation trivia in reducing elevator use

Demographic Profile	Correlation Coefficient r^{pb}	Interpretation
Age	-.013	Negligible correlation
Gender	-.422	Moderate correlation
College	-.753	High relationship
Body Mass Index	.897	High relationship

Correlation analyses reveals that among the demographic profiles only age has negligible correlation to the perception of energy conservation trivia in reducing elevator used. This results were similar to (Kinsey et.al. 2011) that the post-teen individuals were mostly use the elevator rather than the stairs, even though they were exposed in the scientific information on the health benefits of using the stairs.

On the hand, gender moderately correlated with the perception of energy conservation trivia in reducing elevator use, giving a correlation coefficient of -.0.422. Female respondents were most likely used the stairs for health consciousness reasons. Similarly (Blamey, 1995) emphasized that women, has a quick response in cooperating in a project titled "health promotion by encouraged use of stairs".

Most engineering and business students have been responded a less than 2 (agree) in the energy conservation trivia. A high relationship of both variables were computed with a correlation coefficient of -.753. The curriculum of the program maybe play an important role in the students' initial knowledge of energy conservation. Engineering students has a basic Physics courses as early as first year while business courses has physical sciences which energy conservation study are part of the syllabi.

Body mas index of the respondents maybe play an important role for the respondents' agree of the use of stairs rather than elevators. The correlation coefficient of .897 interpreted as high relationship obtained because of the positive response of the overweight and obese respondents. In contrast, (Mitra 2012) characterized that people with normal body mass

index were mostly cooperated in the concept of using stairs for health purposes. Obese and overweight individuals have been expeience a greater challenge to use the stairs, especially when they are working for long hours. They rather used their energy to work rather than spending so much energy using the stairs.

CONCLUSION AND RECOMMENDATION

Respondents' ages were between 16 and 22 years old and majority of them were freshmen aged 16 years old, comprising 19% of the total sample population. 64% of the respondents' were female and the majority were came from CITHM, 43% and COES, 25%. Majority of the respondents (33%) belong to normal body mass index, 6% were underweight, 2% overweight and 1% obese category. The twelve statement that emphasized energy conservation trivia in reducing elevator used gave an overall weighted mean of 1.79, interpreted as "agree". Correlation analyses revelead that age, with correlation coefficient of -.013 has a negligible correlation to energy conservation trivia in reducing elevator use. The perception of respondents' in the energy conservation triva in reducing elevator use were all correlated with other demographic profile. Gender, with a correlation coefficient of -.422, interpreted as moderate correlation, College with -.0753, interpreted as high correlation and Body Mass Index, with 0.987 interpreted as high correlation.

It was recomended to increase the number of respondents participated in the study. Energy conservation trivia can be posted in a designated area as well as inside the elevator to test weather the energy conservation trivia were effective in reducing elevator use. Include energy conservation in the syllabi of some related courses and make some program in energy conservation were men has been encourage to participate in energy conservation campaign.

REFERENCES

Andersen L., Franckowiak F.1998. "Can Inexpensive Signs Encourage the Use of Stairs? Resultsfrom a Community Intervention" Annals of Internal Medicine; 129 (5); 363-369. UK.

Blamey A, Mutrie N, Tom A: 1995. "Health promotion by encouraged use of stairs" The BMJ. 1995; 311; 289. USA

De Almeida A, Hirzel S, Dutschke E. 2012. "Energy- efficient elevators and escalators in Europe: An analysis of energy efficiency potencials and policy measures" Energy and Buildings; Vol.47; 151- 158. USA.

Engbers L, Van Poppel M, Van Mechelen W. 2006. “Measuring stair use in two office buildings : Acomparison between an objective and a self-reported method”. Medicine & science in sports Vol. 17(2): 165-171. USA.

French A, Story M, Jeffery R. 2010. “ Environmental Influences on Eating and Physical Activity” Annual Review of Public Health. ; 22 (1); 309-335. USA

Houten R, Nau P, Merrigan M. 2013. “Reducing Elevator Use: A Comparison of Posted Feedback and Reduced Elevator Convenience” Journal of Applied Behavior Analysis. USA

Kinsey M, Galea A, Lawrence P. 2011. “Stairs or lifts? A Study of human factors associated with lift/elevator usage during evacuations using an online survey”. Pedestrian and evacuation dynamics. P:627-636. USA

Martinez E. 2013. “How to take the stairs instead of the elevators”. Enviroment Alert Journal. Arizona USA

Mitra S. 2012.“20 awesome health benefits of climbing stairs”. Science and Evironment Journal. USA.

Morgan L: “Dis advantages of elevators”.2014; ehow contributor. USA

Nguyen H, Gaudet E. 2000. “A Comparative Evaluation of Fine Regeneration and Non-Regenerative vector controlled drives for AC gearless elevators” Industry Application Conference; 3; 1431- 1437. USA

Norton A. 2011. “Stair get you there faster than elevator, Doctor study finds huff post healthy living”.USA.

Olander E, Eves F. 2011. “Elevator availability and its impact on stair use in a workplace”. Journal of environmental psychology. Vol. 31(2): 200-206. USA.

Pezzini L: “Advantages of using elevators”. 2010; ezine articles, USA.

Soler R, Leeks K, Buchanan L, et al. 2010. “Points of decision promts to increase stair use”. American Journal of Preventive Medicine. Vol. 38(2): 292-300. USA.

Stipanuk D. 2001. “Energy Management in 2011 and beyond: operational options that reduce useand cost” the Cornell Hotel and restaurant administration quarterly. Vol. 42(3) : 57-70. UK.

Teh K, Aziz A. 2002. “Heart rate, oxygen update and energy cost of ascending and descending the stairs” Medicine and Science in Sports and Exercise; 34 (4); 695-699. USA.