



DEFENCE AGAINST FIRE: TECHNOLOGY ACCEPTANCE MODEL OF INNOVATIVE GRILL LADDER FOR TERRACE HOUSES

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ABSTRACT

The purpose of this research is to determine the acceptance of the usage of innovative grill ladder by terrace house owners at Taman Subang with reference to the community acceptance towards innovative grill ladder, their practices and attitude towards fire safety. Sample size calculation was done using sample calculator. With the confidence level of 95 % and confidence interval of 15 of 400 population size, a sample of 39 required for this study was revealed. 40 house owners were then chosen using systematic sampling. The approach that was used for this study was interviewer-based questionnaire uploaded into google form which had Cronbach Alpha value of 0.89 which meant that the questions were reliable. Collected data were analysed using SPSS version 20. The results proved that majority of the community of Taman Subang agreed towards the usage of innovative grill ladder. However, most of them did not agree to the commercialised price of the grill ladder, which is RM1,500. They suggested that the price will be affordable if it lies below RM1,000. On the other hand, most of the participants were lacking practices towards fire safety but they still have positive attitude towards fire safety.

1.0 INTRODUCTION

In Malaysia, it is common to fit grills to the windows and doors of houses. The use of these grills (doors and windows) properly known as burglary proof grills in housing often serves as a strong barrier to effective rescue operation in emergency such as fire, therefore the security protection it offers against intruders has been an issue of great concern to the scholars as well as professionals in the built environment [1-4]. Reports from the Fire and Rescue Department of Malaysia (FRDM) attended to 33,640 fires in 2013 over the country or an average of 92 cases per day [4]. This figure was the highest annual figure recorded, continuing the general upward trend since 2007. A sharp increase of fire incidents in 2012 had killed 72 civilians but this was the lowest number of fatalities for the last seven years. These death statistics refers to instant death at the place of occurrence, therefore the actual number of deaths because of fire is higher [5-6].

A grill ladder was invented in April 2019 as an escape device for installation in terrace houses and had guidelines of usage in both English and Bahasa Malaysia. The installation of this device is on the grill itself; the house owner will have the grill refastened with special hinges and can be opened in the event of a fire. A technology acceptance survey must be conducted to determine the acceptance of this invention. Therefore, the rationale for this study is to determine whether house owners would install this device in their home and would use it in the event of a fire [7-8].

2.0 CASE STUDY RESULTS

Based on the socio-demographic characteristics of the respondent, the most recorded respondents are Malay which is 57.8 %. This can be seen as mostly the residents of Taman SS3 are mostly Malay. Most of the respondents were male being 55.0 % of the respondents whereas female by 45.0 %. Moreover, the age for the respondents is mainly between 58-57 years old, which is 52.5 %. This is due to workpeople who are at home are mostly retired workers. The younger age group which is 18-37 is the least recorded with people with age group more than 77 which is 2.5 %. On the occupation side, mostly the residents are retired which is 40.0 % followed by housewives with 17.5 %. The most recorded of their last education level was tertiary with 67.5 % which portrayed age group as mostly the respondents are of old age. This could be seen that the respondents are highly educated as shown in Table 1.

Table 1. Socio-demographic description of respondents

Description		Count (n)	Percentage (%)
Gender	Male	22	55
	Female	18	45
Race	Malay	23	57.5
	Chinese	10	25
	Indian	6	15
	Other	1	2.5
Age	18-37	3	7.5
	38-57	15	37.5
	58-77	21	52.5
	>77	1	2.5
Occupation	Professional	4	10
	Managerial	5	12.5
	Technical	2	5
	Housewives	7	17.5
	Retired	16	40
	None	2	5
	Others	4	10
Education level	Tertiary	27	67.5
	Secondary	11	27.5
	Vocational	2	5

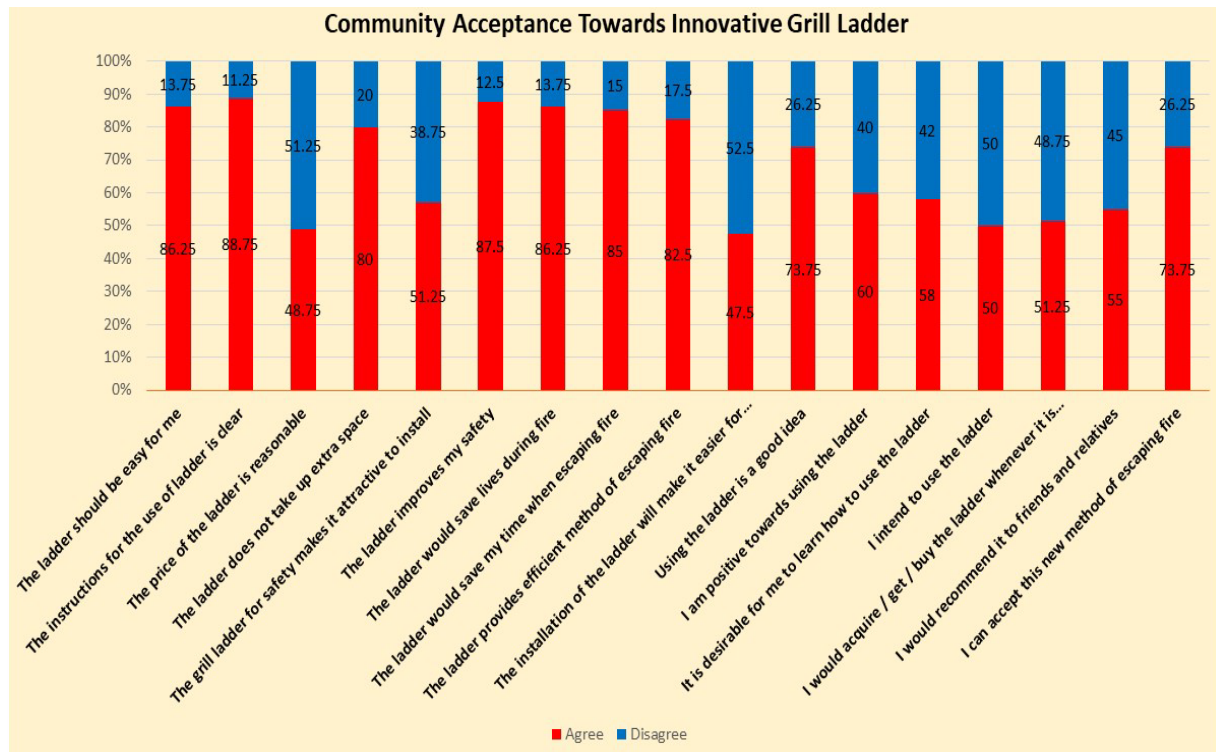


Figure 1. Community acceptance towards innovative grill ladder

These are the data regarding the respondents' acceptance towards the innovative grill ladder. Most of them give a positive response towards the acceptance and think implement it in each house is helpful and could saves life. However, on the other side, most of them would not use it in their own houses as the price of the ladder is not reasonable as we state it could be around RM1,500. The respondent's idea is to reduce it by less than RM1,000.

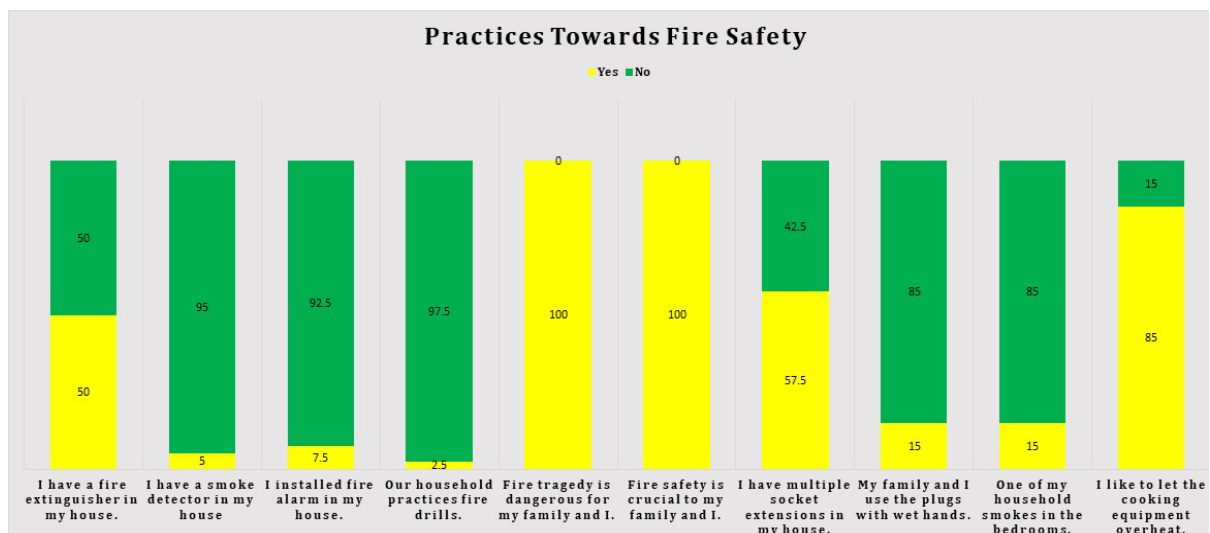


Figure 2. Practices towards fire safety

The data shown above is about practices of respondents towards fire safety. It could be seen that most of the residents of Taman Subang SS3 lack of safety measures and fire safety equipment at their houses. This could be seen as only 50.0 % of them have fire extinguisher in their house and only 5.0 % of them have smoke detector. Towards the positive side, most of them did not smoke in the bedroom or in the house and did not use the plugs with wet hands.

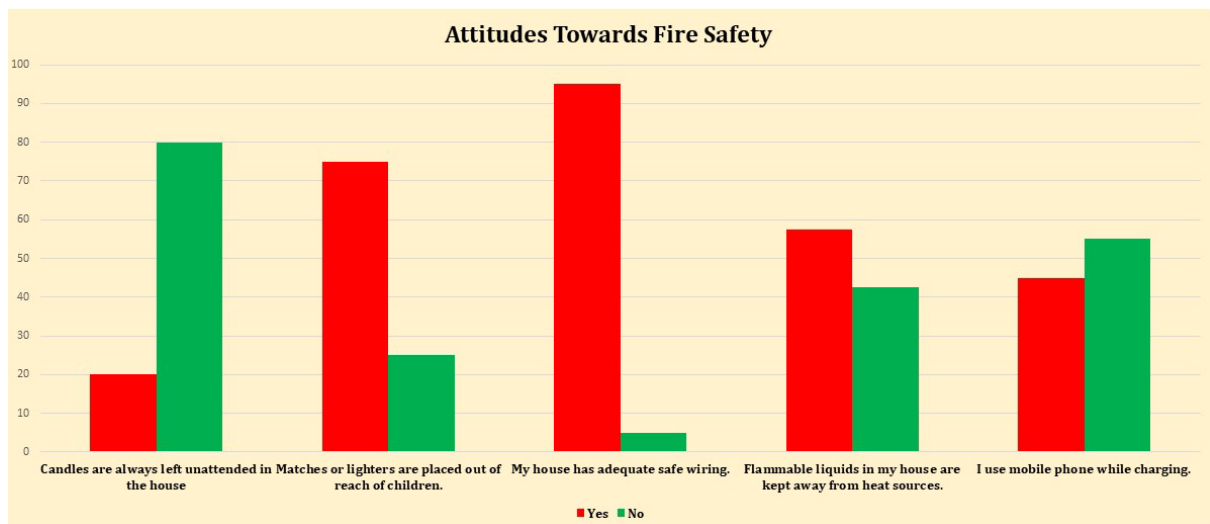


Figure 3. Attitudes towards fire safety

The data above show attitudes of the respondents towards fire safety. Most of them show a good attitude and did not apply any negative responds towards it.

3.0 DISCUSSION

From the survey, the respondents we have chosen were mostly male, Malay, around 58 to 77 years old, retired and had tertiary education level. Therefore, we can conclude that most of the respondents were highly educated and concerned about the fire safety around their housing area. The findings from our survey showed that most residents of Taman Subang accept the usage of innovative grill ladder. However, they have suggested that this innovative grill ladder should have been implemented to the developer instead of already built houses. The reason is because some of the already built houses might not be practical for the instalment of this innovative grill ladder. Most of the architecture of houses in Taman Subang areas have been designated for the escape from fire tragedy. Their grill can be opened, and they can jump out from the second floor to the awning. They found that the awning was the main barrier for the deployment of the grill ladder. Other than that, the community did not find that the commercialized price of the grill ladder was reasonable. They suggested that it could be reasonable for them if it lies below RM1000. The aesthetic part of the grill ladder should be improved. Besides using the grill ladder, the people suggested other alternatives for fire escaping such as fire extinguisher ball and escape chute [9-10].

The collected data proves that most of the respondents did not have good practice towards fire safety. Even though some of them have fire extinguishers in their houses but they did not check the expiry date of the fire extinguishers regularly. Least of them have smoke detectors and fire alarm in their houses. Only one house in Taman Subang practices fire drills. All of them acknowledged the danger of the fire tragedy and crucially of fire safety. Most residents have good attitudes towards fire safety. They did not leave their candles unattended, place the matches or lighters out of reach of children, have adequate safe wiring, keep away flammable liquids from heat sources and did not use mobile phones while charging [9-10].

4.0 CONCLUSION

Fatalities can occur anytime and anywhere. It is amazing that many people have little or no idea about the importance of emergency response plans in the event of any emergency, how to deal with them and how to escape safely from the scene should an emergency occur. According to Ferecenzi, the readers in US gave out a lot of comments asking how to pick the best fire escape ladder for their homes which depicts that people are starting to realise the importance of safety against fire incidence using the fire escape ladder. It is found that most Taman Subang residents agreed to purchase and use the ladder. They also agreed to the note that the grill ladder was easy and safe to use. About 73% of them accepted that the grill ladder served as the new method of escaping fire.

5.0 ACKNOWLEDGMENT

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