

The perceptions of plastic packaging usage to pack hot foods among food hawkers at night markets in Kuala Selangor, Malaysia.

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Abstract

Plastic packaging is widely used by hawkers to pack food items within the foodservice industry. Despite of the various benefits brought about by plastics within the foodservice industry, concerns associated to food safety and solid waste disposal have been raised. Therefore, a study that involved 131 food hawkers at night markets in Kuala Selangor, Selangor, had been carried out to evaluate their perceptions pertaining to the use of plastic packaging to pack hot food items. As such, this study investigated the correlations between perceptions of food hawkers towards awareness, health hazards, environmental hazards, regulations, and the practice of using plastic packaging to pack hot edible food items. In addition, this study determined the most relevant predictor that influences the practice of using plastic packaging. A cross-sectional survey that integrated a self-administered structured questionnaire was employed for the purpose of this study. The retrieved data were analysed by using SPSS version 21. The study outcomes revealed that the food hawkers appeared to have good perceptions towards environmental hazard (3.52 ± 0.48) and regulation (3.51 ± 0.38), but poor perceptions on awareness (2.73 ± 0.66) and health hazard (2.55 ± 0.64). Nevertheless, significantly positive and moderate correlations were observed between health hazard ($r = 0.45$, $p < 0.05$), environmental hazard ($r = 0.43$, $p < 0.05$), regulations ($r = 0.42$, $p < 0.05$) and plastic packaging practices. The study reveals that health hazard emerges to be the main predictor of the plastic packaging practices. Hence, future studies may incorporate larger sample size and various locations in Malaysia as this study only serves as a platform to comprehend the practice of packing hot food items using plastic packaging from the stance of food hawkers.

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Introduction

Malaysia has become one of the largest plastic producers and plastic bags suppliers in Asia. A number of plastic products are exported to several nations, including the European Union (EU), China, Hong Kong, Singapore, Japan, and Thailand (Market Watch, 2012). Malaysia, being a developing nation, seems to consume relatively a larger number of plastic bags on daily basis (Rahman and Rahman, 2010; The Sun Daily, 2015), particularly for food packaging purposes (Maidin and Latiff, 2015). Certain characteristics of the materials, such as inexpensive, lightweight, strong, durable, corrosion-resistant, as well as high thermal and electrical insulation properties, make plastics the best choice among consumers and business owners (Thompson *et al.*, 2009; Hopewell *et al.*, 2009). Nevertheless, two particular concerns have, thus far, been raised in

conjunction to the usage of plastic packaging; solid waste disposal and food safety issues (Jayaraman *et al.*, 2011).

As a matter of fact, plastic materials cannot degrade naturally due to their composition characteristics. Some studies have highlighted that plastics and their associated degradation products pose threats to organisms at all tropic levels (Lambert *et al.*, 2014; Seltenrich, 2015), thus causing hazards to the food web (Reisser *et al.*, 2013). Escalating costs and decreasing landfill space have been linked with disposing plastic materials (Zia *et al.*, 2007). Packing food items with plastics has also been reported to cause health hazards due to leaching of chemicals from the plastics to the foods (Farhoodi *et al.*, 2014; Moreira *et al.*, 2015; Chang *et al.*, 2016). Based on these grounds, this study had looked into the perceptions of night market food hawkers in relation to this uprising issue of using plastic

packaging for hot food items. It is hoped that the study outcomes would aid the Malaysian authorities to draw effective regulations pertaining to the usage of plastic packaging, especially for packing hot food items.

Material and methods

Study design and sample

The descriptive cross-sectional survey method had been adopted for this study. In order to determine a sufficient sample size, a prospective priori analysis using G-Power software package was performed with an alpha of 0.05, power of 0.80, a moderate effect size of 0.15, and 4 predictors (Gefen *et al.*, 2011), which resulted in 55 respondents. After weighing in poor response rate and occurrence of missing data, as well as to minimize error during data analyses, the number of sample size was tripled. Nonetheless, during the actual data collection, the survey involved 131 food hawkers who sold hot edible foods at three night market areas in Kuala Selangor, Selangor, Malaysia between April 1st, 2016, and May 30th, 2016. The survey process was completed on-site.

Questionnaire

The bilingual questionnaire (Malay and English languages) employed in this study was adapted from related prior studies (D'Souza *et al.*, 2006; Maibach *et al.*, 2008; Ayalon *et al.*, 2009; Thompson *et al.*, 2009; Troschinetz and Meilicic, 2009; van Birgelen *et al.*, 2009; Gooi, 2010; Jayaraman *et al.*, 2011). The questionnaire was comprised of demographic profiles, perceptions related to awareness (10 items), health hazards (10 items), environmental hazard (8 items), regulation (8 items), and practices of using plastic packaging (10 items). In order to determine the perceptions of using plastic packaging for hot food items, a 5-point Likert scale with 'strongly agree', 'agree', 'neutral', 'disagree', and 'strongly disagree' responses had been designed. Prior to the actual survey, the questionnaire items were validated by selected panel of experts within the subject area. The reliability of the survey instrument, which was tested amongst food handlers who operated their businesses at Puncak Alam area, displayed an acceptable Cronbach's alpha value that ranged between 0.55 and 0.89.

Statistical analyses

The retrieved study data were analysed by using SPSS (SPSS Inc., version 21) for both descriptive statistics and multiple linear regression analyses.

Results and discussion

Out of the total 131 respondents, most of them were males (55.7%), aged between 40 and 59 years old (37.4%), and Malay (88.5%). Almost half of the respondents (49%) had completed their secondary education and had three to five years of experience in selling hot food items, such as fried food, soups, and porridges. Most of the respondents (33%) used plastic bags and polystyrene to pack their food items, while 21.4% of them used plastic bags and plastic film mostly due to convenience and easy storage (29%), cost-effective and convenience (23.7%), as well as cost-effective and easy storage (20.6%). Fried food was the most frequent type of food sold, followed by soups and porridges, as well as other food combinations. It is worthy of note that this scenario is indeed worrisome because fatty foods, storage time, and food temperature accelerate the leaching of chemicals from the plastic material into the food items (Farhoodi *et al.*, 2014; Moreira *et al.*, 2015; Chang *et al.*, 2016). Besides, the presence of phthalate, which is a plasticizer used to manufacture plastics, can pose adverse health effects (Manoli and Voutsas, 2016; Saad, 2016).

Table 1 shows that among the perception variables, environmental hazard (3.52 ± 0.479) was perceived as the most important variable considered by the food hawkers in regard to plastic usage to pack hot edible food items, followed by regulation (3.51 ± 0.38), awareness (2.73 ± 0.656), and health hazard (2.55 ± 0.636). These findings are in line with those reported by Eltayeb *et al.* (2010) where their interviews with business and public organizations had shown that environmental issues have been the main concern in any organizations. In order to address the excessive use of plastic bags, many campaigns have been organized by the Malaysian government associated to environment issues, such as Go-green campaign (Suki, 2013; Hosseinpour *et al.*, 2015), days without plastic bags (Suki, 2013; Zen *et al.*, 2013; Asmuni *et al.*, 2015; Rahim and Rahman, 2018), and recycling campaign (Masrom *et al.*, 2018; Rahim and Rahman, 2018), which could result in higher perception towards and enlightenment regarding environmental hazards. Moreover, this study discovered that food hawkers perceived health hazard as the least to be considered although plastic materials are considered as lethal to one's health. Nonetheless, this particular finding contradicted with that reported by Jayaraman *et al.* (2011), wherein health hazard awareness emerged as a factor that can lead to reduction in plastic usage to pack hot edible food items. The correlational analyses between the practice of plastic packaging

Table 1: Standard multiple regression on perception variables and practices in using the plastic packaging to pack hot edible food items

Variables	Practice (DV)	Aware-ness	Health hazard	Environmental hazard	Regulation	B	β
Awareness	0.204*					-0.06	-0.10
Health hazard	0.45*	0.68*				0.18	0.32*
Environmental hazard	0.43*	0.43*	0.62*			0.16	0.20***
Regulation	0.42*	0.04	0.48*	0.48*		0.17	0.17***
Means	4.03	2.73	2.55	3.52	3.51		
Standard deviation	0.37	0.66	0.64	0.48	0.38		
						$R^2 = 0.279$	
						Adjusted $R^2 = 0.256$	
						$R = 0.528^{**}$	

Note: * $p < 0.05$

to pack food and the independent variables of health hazards ($r = 0.453$, $p < 0.05$), environmental health ($r = 0.434$, $p < 0.05$), and regulation ($r = 0.415$, $p < 0.05$) exhibited significantly moderate correlations.

It is revealed in this study that health hazard appeared to be the main predictor in determining the practice of using plastic packaging to pack hot food items ($\beta = 0.315$, $p < 0.05$) with the total variance explained by the model at 27.9%, $F(4, 126) = 12.187$, $P < 0.001$. A probable reason that leads to this outcome is related to awareness of cancer triggers amongst Malaysians (Suan *et al.*, 2015; Al-Naggar *et al.*, 2015). In fact, Jayaraman *et al.* (2011) shared similar findings, thus signifying that regulation and awareness have some impact upon the practice of using plastic packaging among consumers. On top of the various campaigns established to reduce the usage of plastics to pack food items, stringent enforcement is needed or consumers may take the matter lightly or even dismiss such notion.

Conclusion

This study has projected that health hazard appears to be the main predictor and significantly correlated to the plastic usage practices among the sampled food hawkers. The study outcomes pointed out that awareness and regulations do not play a significant role in the usage of plastic as packaging material. Therefore, the Malaysian authorities would need to double their efforts in creating awareness and in introducing improvements to effectively enforce regulations associated to plastic usage to pack hot food items, which are of utmost importance. As highlighted in prior related studies, plastic packaging poses a threat to the environment and causes health issues at all trophic levels.

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