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**EMPOWERING WOMEN STREET FOOD VENDORS THROUGH**  
**M-TECHNOLOGY: A STUDY IN PENANG, MALAYSIA**

Lalitha Ramasamy (a)\*

\*Corresponding author

(a) Wawasan Open University, 54 Jalan Sultan Ahmad Shah, Georgetown, Malaysia, lalithar@wou.edu.my

*Abstract*

This study was aimed to gauge the food safety and hygiene practices of women street food vendors. The purpose of this study is to understand food safety and hygiene practices and to gain insight knowledge on personal hygiene, food handling, food cooking and food packaging practices among women street food vendors. This study was done in selected urban areas in the mainland of Penang. Qualitative approach of was adopted to collect data. Non-probability sampling technique of convenient sampling was employed in this study. Thirty-five (35) women street food vendors were interviewed. An in-depth interview with 15 interview questions were used to record the responses of the participants. Observation approach was conducted to assess on food preparation, cooking and service while selling their foods and beverages. The findings revealed that a majority of the vendors (94.3%) were not registered or licensed as food business operators. Only 5.7% of street food vendors attended at least one food safety training. The study found that women street food vendors don't possess formal training on food safety and hygiene practices in food preparation, handling and storage. The study concluded with suggestions of mobile-technology training application development to enhance street food vendor's compliance to food safety and hygiene practices.

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**Keywords:** Informal sector, street food vendors, hygiene practices, mobile technology, food safety and mobile training.



## 1. Introduction

The informal sector is an income spawning activity that is partly or fully outside government regulation and taxation. Street vending is a predominant activity in the informal sector and women are found sprawling this economic activity. Women take up street vending to support and supplement household income for a sustainable livelihood (Mukta, 2014). In Malaysia this type of business in the informal sector is called “penjaja”. Street vending is one of the few readily and accessible avenues open for employment especially to women from poor households. Women vend all different types of products ranging from food, fruits, household utensils, clothes, electrical equipment, home appliances and many more goods. Women in particular are affected by the in formalization of work and they tend to be over presented in informal employment both in developing and developed nations (Rane, 2011). It’s an evident that the informal sector provides work opportunity for women who have low or no education and skills. Wongtada (2014) mentioned that women are more likely to work in the informal sector than men due to double burden, particularly on child and elderly care.

Chakanya (2008) reported that there aren’t any labour standards at the international level to protect street vendors. Many countries specifically regulate street vending by providing a clear legal framework and jurisdiction authorizations. In the case of Malaysia, informal traders still need to register their business with the local district council in each state. In Penang it is known as Majlis Perbandaran Seberang Perai (MPSP) in the mainland and Majlis Bandaraya Pulau Pinang (MBPP) in the island. Street vendors must register with MPSP and MBPP to obtain vending license (lessen penjaja) but they are not required to be registered with Suruhanjaya Syarikat Malaysia (CCM).

“Street Food” is referred to foods and beverages that a ready or available to eat and are sold and prepared in public places. Street food can be eaten at the sales spot or have taken and eaten elsewhere (WHO, 2010). This type of vending is seen in public places, especially in urban areas (Mukta, 2014). Women are more commonly found in street food vending activity, due to many reasons; (i) low education qualification (ii) low in basic business skills (iii) low employment opportunities (iv) caring for child and senior members of the family (v) low knowledge on laws and orders on food safety (vi) nature of food safety and hygiene practices and (vii) limited excess to capital (Wongtada, 2014). There is an advantage in street food vending as it ensures continuous food supply to their family (FAO, 2009). Women may choose to cook and sell from home or to cook and sell on the streets. Nevertheless, there are questions raised on the quality and safety of the street foods. There lies a risk of food poisoning resulting from street vended food (FAO, 2009). Streets vendors are reflected as unhygienic and lack of awareness and knowledge on food preparation among food vendors (Rane, 2011).

Street food vending is known as a pre-dominant economic activity in fulfilling food demand in urban areas of Penang. However, not much is known about food safety and hygiene practices that are practiced by street food vendors. In this study, emphasis given to women selling foods and beverages prepared and sold in the streets. These vendors don’t have permanent built up structures and operate in a temporary static structure of mobile stall which is set up using canopy or tent. These types of street food vendors are found not having vending license from the Municipal Council. Numerous research shown that hygiene practices to be the prominent problem among the street food vendors (Andy et al., 2015; Lalit et al., 2015). There are many factors that leads to poor food safety and hygiene practices that was identified such as, lack of food

safety knowledge, educational level and poor attitude towards food safety (Cuprasitrit et al., 2011; Mulugeta & Bayeh, 2012; Afolaranmi et al., 2015; Mohd. Firdaus Siau et al., 2015).

## **2. Problem Statement**

This paper sought to address many aspects of hygiene practices such as, preparation skills, preparation place and location, handling and storage of food. The research problems sought to be addressed in this study is the lack of awareness and knowledge of food safety and hygiene practices in preparation, handling and storage of food among women street food vendors. Thus, there is a gap in empowering women street food vendors on food safety and hygiene practices using mobile technology (m-technology).

## **3. Research Questions**

- What is the food safety and hygiene practices knowledge of women street food vendors?
- How women street food vendors ensure hygiene practices in preparing and handling food?

## **4. Purpose of the Study**

The purpose of this study is to identify the knowledge of women street food vendor on food safety and hygiene practices. Besides that, this study too intends to further understand the hygiene practices of women street food vendors in preparing and handling food.

## **5. Research Methods**

This study was conducted in selected urban areas in Seberang Perai the mainland of Penang state. Despite of many food courts and established food vendors, street food vendors remain to be the favourite for customers. Qualitative methodology was employed in this study. Non-probability sampling technique of convenient sampling was used. In-depth interview conducted with thirty-five (35) women street food vendors. The questionnaires used in this study were adapted from the study done by Rahman et al., (2012) in Northern Kuching City, Malaysia. The questionnaires were administered to the respondents in Bahasa Malaysia (Malay language) depending on the respondent preferences. The interview questions were divided into two parts, the first part consists of background information questions of the participants including age, types of business, educational background, training on food safety and hygiene practices, business registration status and finally on the number of years in business. The other part of the interview questions focused primarily on the awareness and food knowledge, safety, personal hygiene, safety practices, establishment information and knowledge of laws and orders. Fifteen (15) interview questions were used to record the responses of the participants. Observation approach was conducted to assess the hygiene practices of women street food vendors in food preparation, cooking and service while selling their foods and beverages. The data was recorded and analysed using Microsoft Excel.

## 6. Findings

### 6.1. Background Information

Twenty-nine (29) women street food vendors interviewed sold foods ranging from breakfast, lunch and snacks while the balance six (6) vendors were involved in beverages like tea, coffee, milk and fresh juices. Table 1 illustrates the types of food sold. About 22.9% women sold only breakfast and 28.6% sold only lunch. Followed by 20% women sold both breakfast and lunch while 11.4% women sold snacks and 17.1% women sold beverages.

**Table 01.** Types of foods sold

Type of Food Sold	Percentage
Breakfast	22.9(8)
Lunch	28.6(10)
Breakfast and Lunch	20.0(7)
Snacks	11.4(4)
Beverages	17.1(6)
Total	100 (35)

Table 2 illustrates the education level of women street food vendors. Overall total of 68.5% of women street food vendors have secondary level education and 31.5% women have primary level education.

**Table 02.** Education Level of women street food vendors

Education Level	Percentage
Primary Level Schooling	31.5(11)
Secondary Level Schooling	68.5(24)
<b>Total</b>	<b>100 (35)</b>

Table 3 illustrates the age of women street food vendors. Majority of them fall between the ages of 40 to 49 which accounts to 40%. The second highest recorded by the age group 50 – 59 at 31.4%. Followed by age group 20 – 29 that accounts the lowest 11.4% and finally the age group 30 – 39 is 17.2%.

**Table 03.** Age of women street food vendors

Age	Percentage
20 – 29	11.4(4)
30 – 39	17.2(6)
40 – 49	40.0(14)
50 – 59	31.4(11)
<b>Total</b>	<b>100 (35)</b>

Table 4 below illustrates the number of years of street food operators. There wasn't any respondent fall in the category of 1 year and less operating their business. Majority of them fall in the category above 10 years of business operation which accounted to 54.3% followed by 25.7% from 6 – 10 years' category. The third category is between 1 – 5 years of business operation recorded 20%.

**Table 04.** Number of years of business operation of women street food vendors

Year of Operation	Percentage
< 1 year	0 (0)
1 - 5 years	20(7)
6 - 10 years	25.7(9)
Above 10 Years	54.3(19)
<b>Total</b>	<b>100 (35)</b>

Table 5 illustrates the training received on food safety and hygiene practices by the respondents. Out of the 35 respondents only 5.7% respondents have attended at least one training on food safety. The balance 94.3% seems to be operating without any formal training on food safety and hygiene practices.

**Table 05.** Training on food safety

Training	Percentage
Yes	5.7(2)
No	94.3(33)
<b>Total</b>	<b>100 (35)</b>

Table 6 illustrates the business registration of street food vendors. The study discovered that 33 (94.3%) out of 35 respondents were not registered to the local authority to obtain “lesen menjaja”. Only two (5.7%) respondents found to have registered to the local council and obtained “lesen menjaja”.

**Table 06.** Business registration status

Business Registration	Percentage
Yes	5.7% (2)
No	94.3% (33)
<b>Total</b>	<b>100%(35)</b>

The tables and explanation presented above summarizes the overall profile of the respondents. Highest percentage of women street food vendors recorded selling only lunch which is 28.6%. The data also proved that women with secondary education are mainstream involved in street food vending activity. They account to 68.5% and this breaks the impression that only those with low education are involved in street vending activity. Mainstream of respondents fall in the age of 40 -49 years’ old which accounts to 40% and the second highest recorded among 50 – 59 age group which accounted to 31.4%. The data also showed 54.3% of the respondents were operating their business above 10 years. The data also revealed only two (5.7%) vendors have received minimum of one training on food safety. The reason is they are registered vendors with the municipal council and have obtained “lesen menjaja”. The municipal council provides training to street food vendors registered with them. These 2 vendors operate in a food court administered by the municipal council which requires “lesen menjaja” to acquire a stall in the food court. This shows that there is a critical need for street food vendors register their business with the local council in order to receive trainings on food safety and hygiene practices.

## 6.2. Food Safety Knowledge

Table 7 shows the findings on food safety knowledge among the respondents in Penang. 31.4% of the respondents were aware of the law and regulations that govern their business but however, they are still keen in operating their business because of the strategic location and attracts many customers. In addition to this 68.6% of the respondents' possessed minimum knowledge on food safety and 22.9% knew that registration and licensing of their business is mandatory. These food vendors try to follow minimum food safety standards to attract customers. 17.1% of the vendors are seen to be wearing hand gloves and head cover while serving food and 22.9% ensured hygiene and sanitation of business surrounding by keeping their vending areas swept and cleaned. In terms of food waste disposal, 42.8% of the vendors' site had covered dustbins for waste collection and overall 65.2% respondents have knowledge on personal hygiene such as washing hand before and after handling food, maintaining short and clean nails.

**Table 07.** Knowledge on food safety among women street food vendors

Subject	Percentage
<b>Knowledge on Food Safety</b>	
Law/Regulation	31.4(11)
Food Safety	68.6(24)
Registration & Licensing	22.9(8)
Wearing hand gloves and head covers	17.1(6)
Hygiene and sanitation of surrounding and vessels	22.9(8)
Maintain and covering dustbins	42.9(15)
Personal Hygiene	65.2(23)

## 6.3. Hygiene Practices through Personal Hygiene, Food Handling, Food Cooking and Food Packaging Practices

Table 8 explains the observation on personal hygiene, food handling, food cooking and food packaging practices of women street food vendors. Observation revealed 77.1% respondents maintained clean and short nails, only 11.4% of the respondents' washes hand before and after handling foods while 62.9% of the vendors are wearing clean clothes. The practice of not washing their hands before and after handling foods may be the main concern due to a high risk for cross contamination. The food handling practices were observed on the usage of separate ladles for different dishes showed 54.3%; keeping food covered 45.7%. The food cooking practice showed the usage of clean water for cooking and washing vessels 71.4%. Clean water for cooking and washing here is referred to the normal tap water. Observation also showed 82.9% on the re-use of cooking oil. There is health hazard in using re-used oil for cooking, bacterial may feed on food particles left in the oil that's not properly strained and stored after it cools. Separate storage of vegetarian and non-vegetarian food is 37.1%. Food packaging practices were also observed. Picking up food with bare hands for packing recorded 74.3%. Vendors tend to use their hands without wearing hand gloves and not using spoons or tongs to pick foods. The foods were being packed in newspapers was 65.7%, thin layer of low grade plastic liners used in packaging was 60%. Observation also noted food is in direct contact with the printing inks in the newspaper which poses a risk to food safety. The vendors were also seen handling money while serving food this may invite food contamination through hand. Money exchanging activities through bare hands may lead to carrying harmful bacteria and

organisms. On top of that, in general it was observed that vendors talk while serving food and this will add on to the risk which may trigger to food-borne infections. Foods placed on trays were also observed to be exposed to flies and other contaminants and this could be a serious hazard.

**Table 08.** Personal Hygiene, Food Handling, Food Cooking and Food Packaging Practices of women street food vendors

Subject	Percentage
<b>Personal Hygiene Practices</b>	
Maintain clean and short nails	77.1(27)
Washing hands before and after handling food	11.4(4)
Wearing clean clothes	62.9(22)
<b>Food Handling Practices</b>	
Usage of separate ladles for different dishes	54.3(19)
Food Sold is kept covered	45.7(16)
Clean water used for cooking	77.1(27)
Separating Vegetarian and Non Vegetarian food	37.1(13)
<b>Food Cooking Practices</b>	
Re-use cooking oil	82.9(29)
Clean water used for cooking and washing vessels	71.4(25)
<b>Food Packaging Practices</b>	
Picking up food with bare hand for packing	74.3(26)
Using thin layer of low grade plastic liners	60.0(21)
Using newspapers for packing	65.7(23)

## 7. Conclusion

Overall, this study has revealed that street food is popular amongst the urban dwellers in Penang because of its easy access and affordability compared to restaurants. Street foods are economically efficient and deeply embedded in the urban economy and urban life. It represents a mixed cuisine and thus enjoyed by the multi-racial community in Malaysia and it has no barriers to age and strata. Street vendors form an important segment of the informal sector. Women street food vendors offer foods for sale without having a permanent stall to satisfy the demands of urban dwellers. The informal sector economy, predominantly monopolised by street vending activities will continue to mushroom in developing countries like Malaysia. The study indicated that street food vendors play a very important role in the urban informal economy by providing employment and offer food to both the urban poor as well as the rich.

Training is primarily a significant element to any food safety and hygiene system. Nevertheless, there were no significant relation between training and food safety and hygiene practices. It accounted to 94.3% respondents of this study are found not to have attended any training on food knowledge and hygiene practices prior to vending street food. This means majority vendor in this study received no formal training on food safety. Egan et al. (2007) propose training must be conducted at the workplace as this will help improve on food safety and hygiene practices. This training must create changes to the behaviours of street food vendors with constant evaluation. The latest Food Hygiene Regulation 2009 provides infrastructure to control the hygiene and safety of food handlers and food premises, clean and suitable utensils and equipment, as well as enforcement activities on food premises including those conducted by the Local Authorities. In Penang the licensing of street vendors is under the jurisdiction of local council which is the

Majlis Perbandaran Seberang Perai (MPSP) and the Majlis Bandaraya Pulau Pinang. With such requirement, all the food vendors should be registered, trained and certified in food safety and hygiene practices before working in food services. These regulations are important in ensuring consumers are provided with clean and safe food at reasonable price.

The result of this study clearly shows that there is a vital need for intervention in food safety and hygiene practices among women street food vendors to improve their business prospects. Since street vendors do not necessarily have time to attend to the formal trainings as it causes economic time lost, the use of m-technology based platform can be productive for developing food safety and hygiene practices training modules. The extensive use of mobile phone provides a productive platform for research and development efforts of information technology application in order to boost economic and human development (Aker & Mbiti, 2010). Mobile phones have evolved to smart phones and it is common for many to own it. One of the most important benefits to smartphones is it has the ability to reach massive number of users in “one click”. The evolution of m-technology should be taken as advantage to develop m-training platform that could be mobilised to create food safety and hygiene practices training for street food vendors. Based on the findings of this study suggestions on technology development is made as below;

- Design and development mobile training (m-training) application that will be able to educate and train street food vendors on food safety and hygiene practices.

The result of this study showed street food vendors crucially need training on a number of areas. There should be series of training developed through this platform. Among the areas that are crucial to be included in the training are;

- Food Safety Knowledge
- General Hygiene Practices
- Personal Hygiene Practices
- Food Handling Practices
- Food Packaging Practices
- Food Cooking Practices

The Food Safety and Hygiene Practices m-training application will help to educate and train street food vendors. There is also an option of electronic learning (e-learning) platforms such as, Massive Open Online Course (MOOC's) to design the food safety and hygiene practices training programs. To accomplish this suggestion, the government should form a software development team to carefully develop, prototype and test this application.

There is an urgent need for the local council to identify and locate street food vendors so that they are formally registered. This will help to curb the problem of un-registered street food vendors and at the same time make compulsory for all registered vendors to complete basic trainings on food safety and hygiene practices. Documentation and licensing of street food vendors would allow local council to identify those employed in street food vending and the types of food sold. This activity must be done annually to keep an up to date data on street food vendors. Importance must be given on providing series of training with respect to laws and practices on food safety standards. There should also be constant monitoring and evaluation done by the officers of the health and food safety division of the local council on food street vendors. An efficient enforcement must be done to street food vendors who are found operating without

“lesen menjaja” and basic food safety training. The state government must also increase the number of food courts and stalls that are cleaner and safer for street food vending.

Therefore, there is an urgent need to enhance the knowledge and awareness on food safety and guidance on food handling practices. Thus, a number of potential and promising opportunities for research, software development and education exist in the area of street vending. This study on women street food vendors have definitely opened a new avenue for research and development, entrepreneurship opportunities in the areas of education, training and technology for street food vendors.

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