Awareness and Preparedness to Natural Hazards among Filipino Female Street Vendors

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ABSTRACT

This paper reports a study on the interplay among socio-demographic characteristics, awareness on and preparedness to natural hazards mediated by the intentions on preparedness among female street vendors. A survey was conducted on female street vendors in Siaton, Negros Oriental, Philippines. Personal, socioeconomic and cultural profiles show the characteristics of the participants that make them vulnerable to hazards. Multiple regression models indicate only one socio-demographic factor is significantly associated with awareness: being in a prohibited vending place. Further, negative binomial regression models reveal that having numerous income-generating projects and large household size have a significant association with lower levels of preparedness, and awareness for a higher level of preparedness. Hence, the female street vendors' characteristics and awareness affect their preparedness to natural hazards. A training program focused on women's rights and preparedness to natural hazards is highly recommended in this context.

Keywords: natural hazards, multiple regression model, negative binomial regression model, informal sector, Philippines.

INTRODUCTION

The robustness of the global impact of natural hazards necessitates an objective assessment of the people's preparedness in a disaster-prone environment. Guhan-Sapir, Hargitt, and Hoyois (2004) informed of the large-scale destruction brought about by the disasters from 1994 to 2003 such that more than 255 million people were affected by natural disasters globally each year with a range of 68 million to 618 million, and 58,000 fatalities with a range of 10,000 to 123,000. Gah (2012) pointed out that the poor are the most vulnerable to natural disasters because they lack the capacity to prepare and cope with the natural hazards.

This study, anchored on the social-cognitive theory, focused on Paton's (2003) model on disaster preparedness. The model integrates health protective behavior of various models to describe the relationship between motivating factors and risk reduction behaviors mediated by intentions (Abraham, et al., 1998; Ajzen, 1998; Bennett & Murphy, 1997; Godin & Kok, 1996; Gollwitzer, 1993; Bagozzi, 1992; Ajzen, 1991). The motivators which Paton (2003) labeled in the first phase as precursor variables are based on the health protective behavior and contemporary approaches to public hazard education (Sjoberg, 2000; Lindell & Perry, 1992). The factors cover

the following: critical awareness of hazards, risk perception, and hazard anxiety. The second phase focuses on intention formation variables which include: outcome expectancy and self-efficacy (Abraham et al., 1998; Bagozzi & Edwards, 1998; Bennett & Murphy, 1997; Bandura, 1992, and Schwarzer, 1992) with further inclusion of problem-focused coping not present in the health models and response efficacy, referring to the availability of resources that can facilitate the desired action.

Linking intentions and preparedness, Paton (2003) identifies several variables potential for achieving preparedness. In this phase, Paton integrated various models to determine the specific variables on preparedness which include: sense of community (Bishop et al., 2000; Paton et al., 2000), perceived responsibility (Ballantyne et al., 2000; Duval & Mulilis, 1999; Lindell & Whitney, 2000; Mulilis & Duval, 1995; and Paton et al., 2000), timing of hazard activity (Mulilis & Duval, 1995), normative factors Trust Empowerment (2000), and response efficacy with inclusion of trust and participation/empowerment. Paton's (2003) model illustrates the different factors that can contribute to the success of any hazard education program.

On the preference of the women street vendors in this study, the literature review revealed that the nature of women makes them vulnerable to the natural disasters. Anderson stressed that women are more prone to natural disasters than men (see Enarson, 2000) due to their employment in low-income jobs, traditional expectations and home-based responsibilities, and health dangers due to multiple births. Cannon (in Neumayer & Plumper, 2007) also argued that "there are no generalized opportunities and risks in nature, but instead there are sets of unequal access to opportunities and unequal exposures to risks which are a consequence of the socio-economic systems" (emphasis in the original).

In many countries, women's roles are to look after and protect children and the elderly as well as the family's domestic property. And this hampers their self-rescue efforts in almost any type of natural disaster (Oxfam International, 2005; Schwoebel & Menon, 2004; Beinin, 1981 in Neumayer & Plumper, 2007).

In Asia, women belong to the lowest category among street vendors mostly driven to this livelihood due to poverty, unemployment, low educational background, and family responsibilities (Bhowmik, 2005). Further, the plight of this sector reveals various levels of government involvement which either alleviate or worsen their situation. For example, the female street vendors in Bangladesh have the most severe condition since street vending is considered an illegal trade and they continuously meet harassment from authorities. Sharmin and Islam's (2013) study informed that women's limited access to resources and decision-making process increases their vulnerability to climate change. The reports from the hawkers' department of the government of Singapore (cited in Bhowmik, 2005) said that this is the only country in the world where all street vendors are licensed. They have helped lower the cost of living down, but planners rarely recognized their significant contribution to the local economy. In Hanoi (Vietnam), female street vendors move from door to door carrying their wares in two baskets slung on two ends of a pole carried on the shoulders (see Bhowmik, 2005). Tantiwiramanond's study (see Bhowmik, 2005) also found that half of the women vendors are young, below 29 years old and a quarter of them are single, and coming from large low-income families, and at least five siblings. In India, the formulation of the National Policy on Street Vendors in 2004 led to the recognition of the status of street vendors (Dalwadi, 2010).

The Philippines is one of the countries in the world frequently visited by devastating natural

calamities. As such, many studies on finding measures to mitigate the adverse impact especially in disaster-prone areas had been conducted. Espina and Teng-Calleja (2015) determined the individual and environmental factors that predict disaster preparedness using the social-cognitive perspective. Risk perception, the severity of disaster experience, and community disaster preparedness were found to be predictive factors to preparedness behaviors whereby the strongest determinant is disaster experience. Further, education directly affecting risk perception is consistent with the findings from eleven original empirical studies set in different socio-economic, cultural and hazard-prone contexts (Hoffman & Muttarak, 2017; and Muttarak & Lutz, 2014). Hence, highly educated people have a better capacity to prepare, to respond and to recover from the negative impacts of natural disasters.

Typhoon Haiyan ("Yolanda" in the Philippines) was one of the strongest typhoons that visited the Philippines in modern times. Esteban et al. (2016) conducted a study to find out the level of awareness and preparedness of the residents about storm surges. They conducted structured questionnaires and focus group interviews and discussed the results with the government officers and disaster risk managers as the key informants. One of the key problems revealed was how people were not able to understand the concept of a storm surge. Despite warnings, many residents and local authorities did not urgently respond but "under-estimated' the event on the belief that they could just evacuate at a later time or when the storm had already begun (Esteban, 2015), a typical response from the residents. The results reveal that better education and new coping strategies are necessary to improve resilience in the community. Additionally, it is essential to strengthen the institutional capacity of barangays (small villages) on disaster risk reduction including regular

community disaster awareness and preparedness initiatives emphasizing the cost of a disaster, the value of participation and volunteerism, and livelihood and savings formation (Razafendrabe et al., 2015).

The context of this study is a rural municipality with rivers, lakes, and mountains covering some parts of the locality and often labeled as the "rice bowl" of the South. It situates in the southern part of Negros Oriental Province, Philippines. This municipality has an area of 335.9 sq. km. and about 50 km. away from Dumaguete City, the capital city of the province (http:/dumaguete.com/siaton-negros-oriental). The research environment indicates that its primary industry is agriculture, and for the coastal areas, fishing is the main source of income. Such products provide commodities for street vending among those who are unemployed depending on their financial resources or access to credit. By inference, it is a disaster-prone environment, and this fact necessitates preparedness to mitigate the adverse impact of natural hazards.

Street vendors are a well-studied sector due to their prevalence in almost all parts of the globe and its primary association with the consequence of urbanization or globalization. This study emphasizes on the informal sector largely belonging to the less-educated population of the rural municipality. Specifically, this study focused on the participants' characteristics, critical awareness of hazards, intentions to preparations, and preparedness to the natural hazards. We gathered the participants' personal, socioeconomic, and cultural profiles to determine whether their characteristics are significantly related to their awareness and preparedness in this context. This paper argues that female street vendors' characteristics can affect their awareness; thus, this study sought to answer the following questions:

1. What are the participants' levels of

awareness to natural hazards based on their knowledge, coping strategies, and attitude?

2. To what extent are their intentions to prepare for the natural hazards?
3. What is the relationship of the participants' characteristics and level of awareness to the natural hazards?
4. Did the participants' characteristics and awareness affect their preparedness to the natural hazards?

Methods

The study surveyed ninety-five (95) female street vendors in Siaton, Negros Oriental, Philippines. They were selected using purposive sampling due to the nature of their livelihood; the street vendors just come and go, so it is hard to track down their total population.

The characteristics of the female street vendors are presented in the personal, socio-economic and cultural profiles. The personal profile covers age, marital status, and educational attainment. Data in Table 1.1 show that the participants are mostly middle-aged, married and belong to the elementary level.

Table 1.1 Personal Profile.

Variable	*n*	%
Age		
15 – 20 years old	3	3.3
21 – 25 years old	5	5.4
26 – 30 years old	9	9.8
31 – 35 years old	13	14.1
36 – 40 years old	10	10.9
40 and above	52	56.5
Marital status		
Single	11	12.0
Married/Widow	81	88.0

Table 1.1. Con't...

Educational attainment		
None/illiterate	5	5.4
Primary	5	5.4
Elementary School	41	44.6
Secondary/High School	24	26.1
College	17	18.5

The socioeconomic profile of the participants (Table 1.2) includes average daily income, income-generating activities, access to credit/capital, access to the vending place, allocations for health, and information gadgets. The income varies, but the highest-earning is 500 daily and above. They have other income-generating activities, and the highest percentage goes to cookery. At least more than half of them have capital or access to credit and vending place; the majority are renting their vending sites with just a few in free and prohibited vending areas. Almost one-fourth does not have any allocation for health with the rest having set aside a certain amount for this purpose. Lastly, the street vendors in this locality have access to information on their TV, radio and mobile phones.

Table 1.2. Socioeconomic profile of the participants.

Variable	*n*	%
Average daily income		
0 to P50	15	16.3
P51 to P100	10	10.9
P101 to 150	2	2.2
151 to 200	6	6.5
201 to 250	5	5.4
251 to 300	4	4.3
301 to 350	4	4.3
351 to 400	2	2.2
401 to 450	5	5.4
451 to 500	7	7.6
500 and above	32	34.8

Table 1.2. Con't...

Income-generating activities		
Cooking/cookery	14	15.2
Solid waste recycling-selling	4	4.3
Sewing	3	3.3
Food preservation	9	9.8
Livestock	4	4.3
Backyard gardening	9	9.8
Tutorial services	2	2.2
Manicure, pedicure etc.	4	4.3
Catering, housekeeping	3	3.3
House decorating	1	1.1
Others	15	16.3
Access to credit/capital (Yes)	30	54.3
Access to vending place		
Free access	22	23.9
Access by paying fee	63	68.5
Area prohibited for vending	7	7.6
Allocations for Health		
No allocation from the net income	22	23.9
1 – 3% of the net income	18	30.4
4 – 6% of the net income	14	15.2
7 – 9% of the net income	4	4.3
10 – 12% of the net income	11	12.0
16 – 19% of the net income	1	1.1
20% or more of the net income	12	13.0
Information gadgets		
TV	50	54.3
Radio	57	62.0
Mobile Telecommunication	53	57.6
Internet	5	5.4
Fax	0	0
Early warning devices	2	2.2

Table 1. 3. Cultural Profile.

Variable	n	%
Household size		
equal or less than 3	23	25.0
4 – 6	45	48.9
7 – 10	17	18.5
11 or more	6	6.5
5	1	1.1
Number of children		
none	11	12.0
1 – 2 children	28	30.4
3 – 4 children	22	23.9
5 – 7 children	23	25.0
9 or more	7	7.6
Other	1	1.1
Domestic work		
Cooking food	27	31.8
Fixing/cleaning the house	40	49.4
Feeding livestock	6	7.1
Backyard gardening	4	4.7
Others	6	7.1
Care work		
children	27	31.8
husband	42	49.4
sick or elderly parents	6	7.1
Other relatives	4	4.7
Others	6	7.1
Access to health systems		
Phil Health	51	55.4
Access to Municipal health center or hospital	27	29.3
Medical mission	0	0
Educational institution community health care extension services	0	0
Tradition medicinal health care	8	8.7
Others	3	3.3

Profile on cultural characteristics in Table 1.3 includes such variables as household size, the number of children, domestic work, care work, and access to the health system. The household size is average (4-6) which seems to correspond to their number of children (1-4). Aside from vending, almost all do domestic work such as cooking and cleaning with several also feeding livestock and gardening in addition to caring for husband and children. This finding reveals that women in this locality do multiple responsibilities aside from being a breadwinner. Positively, the majority have access to health systems like Phil Health and the municipal health center.

Measures

The independent variables include the participants' characteristics categorized as: personal, socio-economic and cultural which were computed by percentage. Then, the levels of awareness of natural disasters served as intervening variables such as knowledge, coping strategies and attitude determined by using percentage and mean. The dependent variable is preparedness to natural disasters.

Independent variables

Age was coded as: "6-14 years = 1," "15-20 years = 2," "21-25 years = 3," "26-30 years = 4," "31-35 years = 5," "36-40 years = 6," and "40 years and above = 7." Marital status was a binary variable: "Single = 0" and "Married/Widow = 1." Education was coded as: "None/illiterate = 1," "Primary = 2," "Elementary School = 3," "Secondary/High School = 4," "College = 5" and "Technical/Vocational = 6." Daily income was coded as "0 to 50 pesos = 1," "51 to 100 = 2," "101 to 150 = 3," "151 to 200 = 4," "201 to 250 = 5," "251 to 300 = 6," "301 to 350 = 7," "351 to 400 = 8," "401 to 450 = 9," "451 to 500 =

10," and "500 and above = 11." If the respondent had another income generating projects, he/she was coded as "1", otherwise "0". Access to any credit institution was coded as "Has access = 1" and "Has no access = 0." If the respondent legally paid for the access of the vending place, he/she was coded as "1", otherwise "0". Another variable is access to vending place as prohibited (i.e. not legal), which was coded as "Yes =1" and "No = 0." Allocation for health was coded as: "No allocation from the net income = 1," "1-3% of the net income = 2," "4-6% of the net income = 3," "7-9% of the net income = 4," "10-12% of the net income = 5," "13-15% of the net income = 6," "16-19% of the net income = 7," and "20% or more = 8." The availability of information gadgets (e.g. cellphones, laptops, radios etc.) was also measured and coded through the actual number of gadgets possessed the respondents at home.

Household size was coded as "Equal or less than 3 = 1," "4 to 6 members = 2," "7 to 10 members = 3," and "11 or more = 4." Number of children in the family was coded as "None = 1," "1 to 2 children = 2," "3 to 4 children = 3," "5 to 7 children = 4," "9 or more = 5." Number of domestic work (e.g., cooking food, cleaning the house, and feeding livestock" the participants were involved was also measured and coded as "Yes = 1" and "No = 0," These responses were then summed to create the number of domestic work the participants did in their household. We asked the respondents whether they still had to care for family members (e.g., children and husband) who were in need of attention due to any health condition. The response was coded as "yes =1" and "No = 0." We asked them whether they had access to health systems such as municipal health center services, Phil Health services, and medical missions. Each response to each of the items was coded as "Yes = 1" and "No = 0," which was summed to create the variable

access to health systems.

Intervening variable

The intervening variable 'awareness to natural hazards' was measured using a scale of 11 items asking the respondents' levels of awareness of the occurrence at their workplace of any natural disaster (e.g., shoreline erosion, drought, flood). Responses to these items were coded as "Not aware = 1," "Somewhat aware = 2," "Aware = 3," "Very aware = 4," and "Extremely aware = 5." These were then summed to create the awareness variable. Higher scores indicate higher levels of awareness to natural disasters.

Dependent variable

The extent of intention to preparedness was measured using a scale of 11 items. The participants were asked whether they had done any of the items such as "Attended meetings or received written information on disaster preparedness?"; "Purchased business interruption insurance?"; and "Attended the emergency drills or exercises conducted by the authorities?". Responses to these items were "Have done," "Plan to do," "Unable to do," "Will not do" and "Does not apply." Each of the response was binary-coded. Those who responded with "Have done" were coded as "1," otherwise "0". We summed up the responses of which higher scores indicate higher levels of preparedness.

Analysis

The relationship between the participants' characteristics and awareness to natural hazards was analyzed using multiple regression models with the effects of the participants' characteristics and awareness on preparedness to natural disasters, the negative binomial regression models

because we treated the dependent variable as a count variable.

RESULTS

Levels of Awareness to natural hazards

The indicators used for determining the participants' levels of awareness are knowledge, coping strategies, and attitude. In Table 2.1, the mean levels of awareness regarding 'knowledge' reveal that in multiple response questions, 'flood and earthquake' have the highest mean followed by a 'landslide', 'household fire', and 'tornado'. This finding implies that they are more familiar with flood and earthquake or these disasters may have frequently been experienced or heard through the media. Drought seems not being treated as a threat though this is an agricultural area based on the mean; the rest of the listed natural calamities may not be so familiar to them.

Table 2.1 Mean Levels of Awareness to Natural Hazards Based on Knowledge.

Variable	n	Mean	
Flood	97	3.67	1.168
Earthquake	90	3.64	1.074
Landslide/Debris Flow	88	3.44	1.294
Household Fire	86	3.17	1.303
Tornado	82	3.04	1.252
Shoreline Erosion	83	2.99	1.142
Sinkholes	82	2.99	1.191
Dust Storm	83	2.93	1.045
Drought	83	2.90	1.185
Wild Fire	82	2.88	1.201
Wind Storm	69	2.72	1.327

Extent of intentions to preparations for natural hazards

Table 2.2 focuses on intentions to

preparedness for the natural hazards. Data show that the higher percentages under 'have done' obtained a 'backup improvised source of energy and batteries or supplies', and the least percentages listed 'purchased insurance' and 'developed a business emergency response plan'. On the category 'plan to do', data show that the highest percentages are 'stored batteries or supplies and 'made arrangement to relocate the vending place' while the least percentage identified 'developed a business emergency plan' and 'purchased business interruption insurance'. The highest percentages in next category 'unable to do' are 'purchased insurance' and 'attended drills and exercises' while the least

percentage listed 'stored the backup improvised source of energy and supplies'. The highest percentages in category 'will not do' pertain to the 'business emergency response plan' and 'business interruption insurance' while the lowest percentages listed 'attendance to meetings' and 'backup gadgets or improvised source of energy'. Lastly, the highest percentage in the category 'does not apply' is 'flood disaster insurance' and 'business interruption insurance' while the lowest is on 'relocating the vending place' and 'storing extra batteries and emergency supplies'. To infer from the results, the participants are aware of the coping strategies, and they know which is important for them to do and which are not.

Table 2.2. Extent of intentions to preparedness for natural hazards among female street vendors.

At your vending activity, have you:	N	Have done (%)	Plan to do (%)	Unable to do (%)	Will not do (%)	Does not apply (%)
Attended meetings or received written information on disaster preparedness?	92	20.9	23.3	25.6	3.5	26.7
Talked with government officials about what to do in an emergency?	92	17.6	24.7	24.7	7.1	25.9
Purchased earthquake or flood disaster insurance?	92	8.2	14.1	27.1	10.6	40.0
Purchased business interruption insurance?	92	6.1	14.6	30.5	11.0	37.8
Developed your capability to evacuate to a safe building?	92	16.9	27.7	18.1	7.2	30.1
Developed your capability in disaster-oriented first aid or light rescue?	83	13.3	24.1	22.9	8.4	31.3
Developed a business emergency response plan?	80	5.0	28.8	27.5	12.5	31.3
Attended the disaster drills or exercises conducted by the authorities?	84	8.3	23.8	28.6	10.7	28.6
Made arrangements to relocate the vending to another site in case of disaster damage or accessibility issues?	92	15.7	31.3	21.7	7.2	24.1
Obtained back-up systems (improvised source of energy and other related gadgets)?	84	28.6	26.2	16.7	2.4	26.2
Stored extra batteries or other emergency supplies?	82	29.3	30.5	11.0	4.9	24.4

Relationship between the participants' characteristics and levels of awareness to natural hazards

We determined the relationship between the participants' characteristics and level of awareness to the natural hazards using the multiple regression models. The data shown in Table 3.1 reveal the following findings:

Model 1: There is a negative relationship between education and awareness of natural disasters. Higher educational attainment has an association with lower awareness of natural hazards.

Model 2: Being in a prohibited vending place is associated with higher awareness of natural hazards.

Model 3: No variables have associations with awareness of natural hazards.

Model 4: One variable has a significant association with awareness of natural hazards when controlling for all socio-demographic variables. Specifically, being in prohibited vending place is associated with higher awareness of natural hazards.

Table 3.1 Multiple regression models of the relationship between the participants' characteristics and levels of awareness to natural disasters.

Independent variable	Model 1	Model 2	Model 3	Model 4
Personal				
Age	-1.387			-1.694
Marital status (single)	-4.081			-4.275
Education	-4.209**			-3.817
Economic				
Daily income		.076		.301
Having other income generating projects		-4.513		-3.428
Access to credit (Yes)		-2.128		-3.264
Paying to Access vending place		.500		-3.580
Access to vending place prohibited		18.042*		20.985*
Allocation for health		.077		-.377
Information gadgets available		-1.076		-.334
Cultural				
Household size			-2.577	-2.744
Number of children			2.001	.952
Domestic work			.442	1.782
Care work			-2.731	-2.942
Access to health systems			.403	.012
Constant	63.581**	39.480**	36.197**	76.738**
Adjusted R^2	.157	.220	.104	.476

*$p<0.05$, **$p<0.01$

To determine whether the participants' characteristics and awareness affect their preparedness to natural disasters, we used the negative binomial regression models. Table 3.2 presents the findings as follows:

Model 1: No variables are significantly relted to preparedness.

Model 2: Only one variable is significantly related to preparedness for natural hazards. Specifically, having a higher number of other income generating projects are associated with lower levels of preparedness.

Model 3: One variable is negatively related to preparedness for natural hazards. Specifically, having a bigger household size is related to lower levels of preparedness.

Model 4: Only three variables are significantly related to levels of preparedness to natural hazards: income-generating projects, household size, and awareness of natural hazards when controlling for all variables.

Table 3.2. Negative binomial regression models on the effects of the participants' characteristics and awareness on preparedness to natural hazards.

Independent variable	Model 1	Model 2	Model 3	Model 4
Personal				
Age	-.057			-.244
Marital status (single)	.255			-.113
Education	.077			.425
Economic				
Daily income		-.019		-.061
Having other income generating projects		-1.141*		-.724**
Access to credit		.320		-.239
Paying to Access vending place		-.264		-.297
Access to vending place prohibited		.825		1.626
Allocation for health		.184		.091
Information gadgets available		-.181		-.250
Cultural				
Household size			-.648*	-.962**
Number of children			-.032	.290
Domestic work			.169	.179
Care work			-.426	-.470
Access to health systems			-.081	.198
Awareness of natural disasters				.071**
Constant	.543	.428	2.378**	-1.074
Likelihood ration X^2	.883	8.018	10.631	33.256

*$p<0.05$, **$p<0.01$

DISCUSSION

In this study, we gathered the background of the participants based on their personal, socioeconomic, and cultural profiles to determine the characteristics of the female street vendors in this locality. The main concerns of this study are as follow: (1) What are the participants' levels of awareness of natural hazards based on knowledge, coping strategies, and attitude?; (2) What is the extent of intentions to preparedness for the natural hazards?; (3) Is there a relationship between the participants' characteristics and their levels of awareness of natural hazards?; and (4) Did the participants' characteristics and awareness affect their preparedness to natural hazards? We used multiple regression models to determine the relationship between the participants' characteristics and level of awareness to natural hazards. And negative binomial regression models on the effects of the participants' characteristics and awareness on preparedness to natural hazards.

The personal profile reveals that they are middle-aged, married and the highest educational attainment is elementary level. This finding shows that these middle-aged married women are double-burdened the breadwinner and at the same time a household head having a low level of educational attainment. To deduce from the data, the participants' elementary education or below may have forced them to do this low-income livelihood.

The socioeconomic profile includes average daily income, income-generating activities, access to credit/capital, access to the vending place, allocations for health, and information gadgets. Findings reveal that they have both positive and negative characteristics based on their socioeconomic status. The highest earning indicated by the participants is 500 daily and above. At least more than half of them have capital or access to credit and vending place; the majority are renting their vending site with just a few in free and prohibited vending area. They have some income-generating activities, and the most preferred is cookery. Almost one-fourth does not have any allocation for health while the rest have set aside little amount. They also have access to information on their TV, radio and mobile phones.

The socioeconomic status shows the participants' vulnerability to natural hazards. With the low earning derived from vending, they engage in other income-generating activities while doing multiple roles at home. Typically, women in Asian countries fall into this kind of situation due to poverty, unemployment, low educational background, and family responsibilities (Bhowmik, 2005). Further, the women's multiple domestic roles are affecting their self-protection in almost any type of natural disaster (Oxfam International, 2005; Schwoebel & Menon 2004; Beinin, 1981; in Neumayer & Plumper, 2007). However, the female street vendors in this locality seem to have a better situation than the street vendors in urban communities for having a safe vending place, access to capital, and information gadgets.

Cultural characteristics also confirmed the double-burdened status of the female street vendors. Finding reveals that although most of them have families not typical to large Filipino family size, the participants were also forced to do multiple responsibilities of street vending, income-generating, and doing household chores including caregiving. A significant majority claimed that they do cooking and fixing/cleaning the house with almost one-half of them still feeding their livestock. Caring for children and husband also has high percentage while doing other care work. Positively, the majority had access to health care system particularly, Phil Health. As what Donner and Rodriguez (2011) said, the person or group's

characteristics and their situation influence their capacity to anticipate, resist, and recover from the impact of natural disasters.

Data on awareness of natural disasters are based on knowledge, coping strategies and attitude. While knowledge is known to be very important in preparedness, related studies informed that despite the efforts and expenditures incurred to educate the people on disaster risks, findings still indicated low levels of preparedness (Paton, 2003). Knowledge as an indicator of awareness (Table 2.1) reveals that they are more familiar with 'flood', 'earthquake', 'landslide/debris flow', 'household fire' and 'tornado' than 'shoreline erosion', 'sinkholes', 'dust storm', 'drought', 'wildfire' and 'windstorm'. 'Flood' got the highest mean probably because it is the most frequently experienced disaster in their locality. Earthquake rarely occurs in this area, but negative ones are happening in other places known by them through the media. Drought regularly occurs every year, but it appears that the threat is not considered severe having a lower mean level as compared to the more familiar ones; the participants seem not so knowledgeable on the rest of the natural disasters.

As what Müller et al. (2011) claimed, psychological factors such as experience, knowledge on disasters, and knowledge about protection measures are more important indicators than traditional indicators such as age, gender, and occupation status (Werg, Grothmann, & Schmidt, 2013). Findings on coping strategies as indicators of awareness have shown varied responses (Table 2.2). The participants are consistent that storing batteries and supplies are necessary and they have done and planned to do including planning to relocate their vending place. They also realized that they were not able to attend drills and exercises related to disaster preparedness. Further, they informed that they would not make a business emergency response

plan or business interruption insurance since these are not applicable to them.

This finding confirms the data wherein they told that the strategies do not apply to them as street vendors. The results seem to show that they are aware of having coping strategies to mitigate the threats from the natural disasters. Contrary to the finding of Ballantyne et al. (see Paton, 2003) that people tend to have the attitude of transferring the responsibility to protect themselves to others, the finding in this section reveals that the participants are aware and have a positive attitude towards preparedness to natural disasters. There is a higher level of attitude on awareness of such disasters as an 'earthquake', 'flood', 'landslide/debris flow' and 'household fire'. The participants' knowledge and experience in their locality influenced their attitude. Moreover, finding shows that they are aware of the coping strategies that they need to do and those that they have to do but unable to do.

There is a negative relationship between education and awareness to natural disasters wherein a relatively higher educational attainment (elementary level) has an association with lower awareness of natural disasters. The finding implies that the participants' educational attainment did not contribute to the participants' awareness having the educational attainment of elementary level and below. Secondly, being in a prohibited vending place is associated with higher awareness of natural disasters. The street vendors are entirely aware of the risk in a prohibited vending area based on the results given. Thirdly, using the multiple regression methods, no variables are associated with awareness of natural disasters but controlling for all socio-demographic variables, only one variable has a significant association with awareness of natural disasters, which is being in a prohibited vending place. Hence, the female street vendors who are illegally vending are aware of their vulnerability to the threats and impact of

natural disasters since they are unprotected.

Negative binomial regression models show the effects of the participants' characteristics and awareness of natural disasters on preparedness to natural disasters. Model 1 indicates that no variables are significantly related to preparedness. Further, Model 2 illustrates that only one variable is significantly related to preparedness to natural disasters and this pertains to the participants' having some other income-generating projects which refer to lower levels of preparedness. Similarly, Model 3 reveals that only one variable is negatively related to preparedness to natural disasters and this is having a bigger household size which is related to lower levels of preparedness. Although the family size and number of children is average, this slightly larger household size has affected their preparedness to natural disasters. Lastly, controlling for all variables in Model 4 shows that only three variables are significantly related to levels of preparedness to natural disasters: income-generating projects, household size, and awareness of natural disasters.

Hence, on the question of whether the relationship between the participants' characteristics and awareness to natural disasters affect their preparedness to natural disasters, the answer can be summed up in three main findings. First, having a higher number of other income generating projects are associated with lower levels of preparedness. Next, having a bigger household size is related to lower levels of preparedness. Finally, higher levels of awareness of natural disasters are related to higher levels of preparedness to natural disasters.

CONCLUSION

The participants are middle-aged married and double-burdened women who became street vendors due to the low level of educational attainment. The socioeconomic and cultural indicators reflect both preparedness as well as vulnerability particularly for earning low from vending and having some income-generating activities while doing multiple roles at home. They have the knowledge, coping strategies, and high attitude on awareness to the natural disasters frequently experienced or known through the media. Being in a prohibited vending place is associated with greater awareness. There are only three variables that are significantly related to levels of preparedness to natural disasters: income-generating projects and household size for lower level preparedness, and awareness for a greater degree of readiness. Hence, the characteristics and knowledge of female street vendors affect their preparedness to natural disasters. We recommend empowerment by giving them training in women's rights and preparedness to natural disasters.

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