

RESEARCH PAPER

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Fire safety management in workplaces of dapitan and dipolog cities based on preparedness, response, and recovery phases**Jocelyn G. Dalman**^{*1,2}¹*Jose Rizal Memorial State University, Dapitan City, Philippines*²*College of Nursing and Allied Health Sciences, Jose Rizal Memorial State University, Main Campus, Dapitan City, Philippines***Key words:** Fire safety management, Preparedness, Recovery phases, Response**Received:** July 21, 2026**Accepted:** July 31, 2026**Published:** August 07, 2026**DOI:** <https://dx.doi.org/10.12692/ijb/29.2.45-53>**ABSTRACT**

This study aimed to evaluate the level of preparedness, response, and recovery phases experienced by the respondents in terms of age, sex, length of service, and educational attainment. The researchers conducted a random selection of respondents found in the bus terminals and public markets of Dapitan and Dipolog, as well as from the Budget Office, Accounting Office, Human Resource and Development Office, Cashier's Office, and Registrar's Office of both JRMSU Main and Dipolog Campus. This study utilized the descriptive correlational method of research using a questionnaire as the main tool for data gathering. Results revealed that the majority of the workers were aged from 46 to 55 years old, with female workers being the dominant respondents. The length of service was five years and below, and most were college graduates. Most of the workers had an average weighted mean of 3.56, 3.73, and 3.39 in terms of preparedness, response, and recovery phases regarding fire safety management. Nevertheless, there was a significant difference in educational attainment in the preparedness and response phases, as well as in sex in the recovery phase. To enhance fire safety management, the researchers proposed that there be a collaboration of services for both agencies, namely the Bureau of Fire Protection and Emergency Medical Service.

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INTRODUCTION

Fire safety management is the set of practices intended to reduce the destruction caused by fire. Fire safety measures include those intended to prevent the ignition of an uncontrolled fire and those used to limit the development and effects of a fire after it starts.

The most common workplace emergency is fire, but by being prepared for emergencies and knowing how to respond appropriately, risks can be minimized. Adequate knowledge of fire safety, as well as the availability of fire safety equipment, procedures, and precautions in every learning institution, is paramount to attaining fire safety preparedness.

Despite the technological advancements in fire safety, fire remains the leading cause of loss of life and property at commercial and industrial facilities worldwide. Consequently, understanding how individuals behave in the case of fire evacuation is essential to align fire safety measures with occupants' needs during an incident. That is why general fire response procedures must be implemented immediately upon suspicion of a fire. While recovery efforts may also be conducted, these are primarily concerned with actions that involve rebuilding destroyed property, re-employment, and the repair of other essential infrastructure.

Disaster preparedness is one of the important elements in disaster risk reduction, and it encompasses community awareness and readiness to render appropriate responses and quick recovery (Ejeta *et al.*, 2015). In addition, preparedness for disasters and emergencies at the individual, community, and organizational levels can play an important role in reducing disaster risks and mitigating their adverse impacts (Ejeta *et al.*, 2015).

On the other hand, the lack of disaster preparedness, as reported in some categories of disaster such as fires (Kukali and Kabuka, 2009), can result in negative economic and social consequences (Wilson *et al.*, 2007).

This study on fire safety management evaluates employees from different workplaces regarding the level or extent of their preparations, knowledge, appropriate actions, and efforts in terms of preparedness, response, and recovery phases in case of fire outbreaks.

This study aimed to evaluate the level of preparedness, response, and recovery phases in the public markets and bus terminals of Dapitan and Dipolog City as well as the Budget Office, Accounting Office, Human Resource and Development Office, Cashier's Office, and Registrar's Office of both JRMSU Main and Dipolog campus.

Theoretical conceptual framework

This research was anchored in the Application of Behavioral Theories to Disaster and Emergency Health Preparedness by Ejeta *et al.* (2015), which emphasized that preparedness for disasters and emergencies at the individual, community, and organizational levels could serve as more effective means to reduce the increasing occurrence of disaster risk and lessen their effects. That is, to take on more important roles in disaster risk reduction (DRR).

Disaster preparedness formed a fundamental part of disaster risk reduction. Preparedness strategies were created by identifying and mapping hazards, analyzing vulnerabilities, and assessing risks, while behavior change strategies were employed to guide how the results of this process can lead to protective measures.

Disaster and emergency readiness initiatives primarily centered on human actions. Human behaviors result from various influences that encompass individuals' risk perceptions and insights gained from both direct and indirect experiences with disasters and emergencies, as well as the interactions between people and their surroundings. These elements work together to affect the character and degree of individuals' readiness for health emergencies and disasters.

The implementation of Republic Act 10121, also referred to as the Philippine Disaster Risk Reduction and Management Act of 2010, established the foundation for a shift in focus from merely preparing for and responding to disasters to comprehensive disaster risk reduction and management (DRRM).

METHODOLOGY

This study utilized the descriptive correlational method of research. The data were gathered throughout the use of self-made questionnaire. The statistical tools used were frequency counting and percentage.

Research environment

This study was conducted specifically at the bus terminal, public market and 5 administrative offices (budget, accounting, human resource, cashier, and registrar) of Jose Rizal Memorial State University in both Dapitan and Dipolog City.

Research respondents

The selected population of the said areas conducted in Dapitan and Dipolog cities.

RESULTS AND DISCUSSION

Table 1 shows the percent distribution of the respondents in terms of age. Among the age brackets provide, respondents whose age from 46 to 55 years old had the highest number of frequency which was 31 or with the percentage of 25.8% of the total number of respondents.

Age 36-45 followed, with the frequency of 29 or with the percentage of 24.2%. The least frequency fell under the age of 56 years old and above and with the frequency of 14 or with the percentage of 11.7%. This means that there were few workers aged 56 and above who are still working in the workplaces of Dapitan and Dipolog City.

Table 1. Percent distribution of the respondents in terms of age

Age	Frequency	Percentage
1. 46 to 55 years old	31	25.8%
2. 36 to 45 years old	29	24.2%
3. 25 years old and below	27	22.5%
4. 26 to 35 years old	19	15.8%
5. 56 years old and above	14	11.7%

Table 2. Percent distribution of the respondents in terms of sex

Sex	Frequency	Percentage
1. Female	76	63.3%
2. Male	44	36.7%

The study of Hotopp (2005, 2007) stated that older workers are becoming more prevalent in the workforce, there are fewer new workers joining the labor force and older workers are continuing to retire early. According to Ilmarinen, (2006); McNair *et al.* (2007), the research in this area suggests that employers can have stereotyped views of the abilities and attitudes of older workers, which can both positively or negatively, influence the retention and recruitment of older individuals.

Table 2 is the percent distribution of the respondents in terms of sex. Results showed that females were dominant with a total frequency of 76 or with the percentage of 63.3% compared to the

frequency of males which is 44 and with the percentage of 36.7%.

According to the World Bank (2012), over the past quarter century, women have increasingly participated in the labor market, partially narrowing the gender participation gap.

Table 3 is the percent distribution of the respondents in terms of length of service. Results showed that the highest number of years in service is five years and below with the frequency of 52 or with the percentage of 43.3%. Followed by 6-10 years with the frequency of 40 or with the percentage of 33.3%. Ten years and above was the least number of years in service with the

frequency of 28 or with the percentage 23.3%. Thus, most of the workers in the workplaces of Dapitan and Dipolog City were working five years and below. According to the study of Titus Oshagbemi (2000) (The

Queen's University of Belfast, Belfast, UK), the enquiry is premised on the assumption that the less satisfied workers tend to resign while the more satisfied ones tend to remain in a job, as some literature suggests.

Table 3. Percent distribution of the respondents in terms of length of service

Length of Service	Frequency	Percentage
1. 5 years and below	52	43.3%
2. 6–10 years	40	33.3%
3. 10 years and above	28	23.3%

Table 4. Percent distribution of the respondents in terms of educational attainment

Educational attainment	Frequency	Percentage
1. College graduate	70	58.3%
2. College level	27	22.5%
3. Secondary Graduate	7	5.8
4. Post Graduate	6	5
5. Elementary Graduate	5	4.2
6. Elementary level	3	2.5
7. Secondary level	2	1.7%

Table 5. The extent of fire safety management of the respondents in their workplaces in terms of preparedness phase, response phase, and recovery phase

Item	Weighted mean	Description
Extent of fire safety management of the respondents in their workplace in terms of preparedness phase	3.56	Great Extent
Extent of fire safety management of the respondents in their workplace in terms of response phase	3.73	Great Extent
Extent of fire safety management of the respondents in their workplace in terms of recovery phase	3.39	Great Extent

Table 6. Test difference in the fire management (Preparedness phase) of the respondents when analyzed as to their profile

Profile	Test statistics		p-value	Ho	Remarks
	Mann-Whitney U test Kruskal Wallis H test				
Age	-	5.139	0.273	Accept Ho	No significant difference
Sex	1419.0	-	0.168	Accept Ho	No significant difference
Length of service	-	4.451	0.108	Accept Ho	No significant difference
Educational attainment	-	19.459	0.003	Reject Ho	Significant difference

Most of the respondents were college graduates, which comprised 58.3% with the frequency of 70. Other educational attainment followed such as college level with the frequency of 27 or 22.5%, secondary graduate with the frequency of 7 or 5.8% and post graduate with the frequency of 6 or 5.0%. Secondary level has the lowest frequency of 2 or 1.7%.

Table 4 is the percent distribution of the respondents in terms of educational attainment. Results showed that most of the respondents are college graduates with the frequency of 70 or the percentage of 58.3%.

Followed by college level with the frequency of 27 or the percentage of 22.5%. Secondary level has the lowest frequency of 2 or the percentage of 1.7%.

This study contradicts to the study of Kaitlin Mulhere (2017) which suggested that over qualification rate is significantly lower than the results of previous studies, which estimated that as many as 48% of bachelor degree holders were overqualified for their jobs. In surveys, recent graduates overwhelmingly rate their college experience as worthwhile, and much research shows that the pay gap between those with and without college

degrees has expanded. Yet other studies suggest that it's harder today for recent grads to find good jobs.

Table 5 shows the extent of fire safety management of the respondents in their workplaces in terms of preparedness phase, response phase, and recovery phase.

1. Extent of fire safety management of the respondents in their workplace in terms of preparedness phase

The respondents' level of preparedness to fire safety management in their work place showed that descriptor 1 to 10 received an average weighted mean of 3.56 which described as great extent or the person gave almost full preparation in all activities and functions in preparedness phase. This means workers in the workplaces of Dapitan and Dipolog City rendered almost full preparation regarding the fire safety management in terms of preparedness phase.

Knowledge among the workers on the level of preparedness can lead to the extent of awareness of the worker, well informed plan and decisions. On the other hand, lack of such knowledge in preparedness phase as it has been reported in some categories of disasters such as flood and slides (Miceli *et al.*, 2008), earthquakes (Srinivas and Nakagawa, 2008), and fires (Kukali and Kabuka, 2009) can result in a negative economic and social consequences (Wilson *et al.*, 2007).

2. Extent of fire safety management of the respondents in their workplace in terms of response phase

The respondents' level of response to fire safety management in their workplace showed that descriptor 1 to 10 received an average weighted mean of 3.73 which described as great extent or the person gave almost full preparation in all activities and functions in response phase. This means the workers in the workplaces of Dapitan and Dipolog City rendered almost full preparation regarding the fire safety management in terms of response phase.

According to the study which stated that numerous individual studies and research syntheses have contrasted common sense ideas about how people respond during crisis based on actual behavior.

Nevertheless, enhancing public understanding of awareness and trust in preparedness measures and in organizations charged with managing fire disasters can lessen the likelihood of panic (Glass and Schoch-Spana, 2002).

3. Extent of fire safety management of the respondents in their workplace in terms of recovery phase

The respondents' level of recovery to fire safety management in their workplace showed that descriptor 1 to 10 received an average weighted mean of 3.39 which described as great extent or the person gave almost full preparation in all activities and functions in recovery phase.

This means the workers in the workplaces of Dapitan and Dipolog City render almost full preparation regarding the fire safety management in terms of recovery phase.

According to the study which stated that fire disaster impacts among businesses, public market and establishments because of pre-existing variation in the vulnerability of social units within each of these categories. Specifically, social vulnerability is people's capacity to anticipate, cope with resist and recover from the impacts of a natural hazard (Wisner *et al.*, 2004).

Table 6 is the test of Difference in the Fire Safety Management (Preparedness Phase) of the Respondents when analyzed as to their Profile. This study presented the Kruskal-Wallis test of difference between the respondents' level of preparedness in the fire safety management when data were analyzed as to their profile. It showed that p-values of 0.273, 0.168, and 0.108 were all greater than the alpha level or level of significance of 0.05 with H-test statistic of 5.139 and 4.451 and U-test statistic of 1419.0. Since the p-values

were greater than the chosen alpha level of 0.05, it can be concluded that there was an insufficient evidence to reject the null hypothesis. Therefore, the data did not support the hypothesis that there was no significant difference in the level of preparedness when analyzed according to age, sex, and length of service, in the fire safety management. This means that responses of the respondents at 0.05 level of significance did not significantly vary.

The study implied that the workers in the workplaces of Dapitan and Dipolog City whose age brackets are 25 years and below, 26-35 years old, 36-45 years old, 46-55 years old and 56 years and above; and those who are males and females, and those whose length of service are 5 years and below, 6-10 years, 10 years and above, did not significantly differ.

This study showed that the p-value of 0.003 was less than the alpha level of or level of significance of 0.05 with H-test statistic of 19.459. It can be concluded that there was an insufficient evidence to accept the hypothesis. This means that responses of the respondents significantly does vary at 0.05 level of significance.

The study implied that the workers in the workplaces of Dapitan and Dipolog City whose educational attainment are elementary level, elementary graduate, secondary level, secondary graduate, college level, college graduate, and post graduate, did significantly differ.

Educational attainment may influence disaster preparedness by shaping individuals' knowledge, risk awareness, and ability to understand and respond to potential hazards. People with higher levels of education may be better able to access and interpret information concerning hazard behavior, preparedness

measures, forecasts, and emergency warnings. In contrast, limited access to relevant information and preparedness knowledge may increase vulnerability and reduce the capacity to take appropriate protective measures during disasters. This relationship is supported by research indicating that self-reported emergency preparedness varies according to educational attainment, with individuals holding post-secondary qualifications generally demonstrating greater preparedness than those with lower levels of education (Menard *et al.*, 2011).

Table 7 is the test of Difference in the Fire Safety Management (Response Phase) of the Respondents when analyzed as to their Profile. This study presented the Kruskal-Wallis test of difference between the respondents' level of response in the fire safety management when data were analyzed as to their profile. It showed that the p-values of 0.087, 0.220 and 0.261 were all greater than the alpha level or level of significance of 0.05 with H-test statistic of 8.141 and 2.686 and U-test statistic of 1447.0. Since the p-values were greater than the chosen alpha level of 0.05, it can be concluded that there was an insufficient evidence to reject the null hypothesis. Therefore, the data did not support the hypothesis that there is no significant difference in the level of response when analyzed according to age, sex, and length of service, in the fire safety management. This means that responses of the respondents at 0.05 level of significance do not vary.

This study implied that workers in the workplaces of Dapitan and Dipolog City whose age brackets are 25 years and below. 26-35 years old, 36-45 years old, 46-55 years old and 56 years and above; those who are males and females and those whose length of service are five years and below, 6-10 years, 10 years and above, did not significantly differ.

Table 7. Test of difference in the fire safety management (Response phase) of the respondents when analyzed as to their profile

Profile	Test statistics		p-value	Ho	Remarks
	Mann-Whitney U test	Kruskall Wallis H test			
Age	-	8.141	0.087	Accept Ho	No significant difference
Sex	1447.0	-	0.220	Accept Ho	No significant difference
Length of service	-	2.686	0.261	Accept Ho	No significant difference
Educational attainment	-	17.683	0.002	Reject Ho	Significant difference

Table 8. Test of difference in the fire management (Recovery phase) of the respondents when analyzed as to their profile

Profile	Test statistics		p-value	Ho	Remarks
	Mann-Whitney U test	Kruskal Wallis H test			
Age	-	5.943	0.203	Accept Ho	No significant difference
Sex	1196	-	0.009	Reject Ho	Significant difference
Length of service	-	1.784	0.410	Accept Ho	No significant difference
Educational attainment	-	10.806	0.095	Accept Ho	No significant difference

It also showed that the p-value of 0.002 was less than the alpha level of or level of significance of 0.05 with H-test statistic of 17.683. It can be concluded that there was an insufficient evidence to accept the null hypothesis. Therefore, the data did not support the hypothesis that there was a significant difference in the level of response when analyzed according to the educational attainment, in the fire safety management. This means that responses of the respondent at 0.05 level of significance significantly did vary.

This study implied that workers in the workplaces of Dapitan and Dipolog City whose educational attainment are elementary level, elementary graduate, secondary level, secondary graduate, college level, college graduate, and post graduate, did significantly differ.

Table 8 is the test of Difference in the Fire Safety Management (Recovery Phase) of the Respondents when analyzed as to their Profile. This study presented the Kruskal-Wallis test of difference between the respondents level of response in the fire safety management when data were analyzed as to their profile. It showed that the p-values of 0.203, 0.410, and 0.095 were all greater than the alpha level or level of significance of 0.05 with H-test statistic of 5.943, 1.784, and 10.806. It can be concluded that there was an insufficient evidence to reject the null hypothesis. Therefore, the data did not support the hypothesis that there was no significant difference in the level of recovery when analyzed according to age, length of service, and educational attainment in the fire safety management. This means that responses of the respondents at 0.05 level of significance did not significantly vary.

This study implied that the workers in the workplaces of Dapitan and Dipolog City whose age brackets are 25 years and below, 26-35 years old, 36-45 years old, 46-55 years old and 56 years and above; those whose length of service are five years and below, 6-10 years, 10 years and above; and those whose educational attainment are elementary level elementary graduate, secondary level, secondary graduate, college level, college graduate, and post graduate, did not significantly differ.

It also showed that the p-value of 0.009 was less than the alpha level of or Level of significance of 0.05 with U-test statistic of 1196. It can be concluded that there is insufficient evidence to accept the null hypothesis. Therefore, the data did not support the hypothesis that there was a significant difference in the level of recovery when analyzed in terms of sex, in the fire safety management. This means that responses of the respondents at 0.05 level of significance significantly did vary.

This study implied that the workers in the workplaces of Dapitan and Dipolog City who are males and females, did significantly differ.

According to the study of Ashraf and Azad (2015) on Gender Issues in Disaster: Understanding the Relationships of Vulnerability, Preparedness, and Capacity, the distribution of aid was unequal, in the sense that aid was directed towards male-headed households. It is evident that there was a lack of participation of women in post-disaster recovery planning. In addition, it is also noted that officials turned away some widows seeking compensation for their lost husbands because they could not produce the body. This simply shows what type of unexpected situation being faced by women at the time of

disaster. Widowed women may experience difficulties in accessing financial assistance and other post-disaster benefits, particularly when aid distribution systems primarily recognize men as heads of households (Ashraf and Azad, 2015).

CONCLUSION

This study concluded that the fire safety management in the workplaces of Dapitan and Dipolog City in terms of preparedness, response, and recovery phase is perceived as with good preparation in all activities and functions as well as with complete contents and knowledge with regards to fire safety measures. Furthermore, the educational attainment in terms of preparedness and response phases did significantly differ which means that the higher their educational attainment, the higher their level of preparedness and response to fire. Also, sex in terms of recovery phase did significantly differ which means that male recovers easily than female.

RECOMMENDATIONS

Based on the findings and conclusion drawn, the researchers propose, in collaboration with the Bureau of Fire Protection (BFP), the Emergency Medical Service (EMS) may have strong tandem in rendering services to the community in terms of preparedness, response and recovery phases of fire safety management that would uplift their capabilities, skills and knowledge. Additionally, the Bureau of Fire Protection and Emergency Medical Service might have a consistent open communication and regular gathering or assembly with regards to their services offered such as in conducting plans, seminars and trainings, and in monitoring of facilities in the workplaces of Dapitan and Dipolog City in order to have improved quality of service and/or there would be less or no incident of fire.

Enforcement also of building codes that advocates, among others, provision of the facilities for the firefighting to ensure compliance to all the safety requirements, as well as imparting knowledge on the use of installed facilities and awareness on the appropriate responses in case of fire outbreaks, are

also necessary for the bureau of fire protection agency to be implemented.

While the disaster preparedness can be enhanced through strengthening the community capacities, education and improving the preventive mechanisms. And taking preventive steps, implementing trainings and drilling simulation exercises can lower risk and prepare employees in case a fire ever does break out in the workplace.

REFERENCES

- Ashraf MA, Azad MAK.** 2015. Gender issues in disaster: Understanding the relationships of vulnerability, preparedness and capacity. Retrieved from <http://www.hrpublish.org/download/20150930/EER4-14004224.pdf>
- Ejeta LT, Ardalan A, Paton D.** 2015. Application of behavioral theories to disaster and emergency health preparedness: A systematic review. *PLOS Currents* 7.
- Glass TA, Schoch-Spana M.** 2002. Bioterrorism and the people: How to vaccinate a city against panic. *Clinical Infectious Diseases* 34(2), 217–223.
- Hotopp U.** 2005. The employment rate of older workers. *Labour Market Trends* 113(2), 73–88.
- Hotopp U.** 2007. The ageing workforce: A health issue? *Economic & Labour Market Review* 1(2), 30–35.
- Ilmarinen J.** 2006. Towards a longer worklife! Ageing and the quality of worklife in the European Union. Finnish Institute of Occupational Health, Ministry of Social Affairs and Health, Helsinki, Finland.
- Kukali AN, Kabuka EK.** 2009. Fire disasters in secondary boarding schools in Kenya. *Journal of Disaster Management and Risk Reduction* 3, 60–71.
- McNair S, Flynn M, Dutton N.** 2007. Employer responses to an ageing workforce: A qualitative study. Department for Work and Pensions Research Report No. 455, Corporate Document Services, Leeds, UK.

Menard LA, Slater RO, Flaitz J. 2011. Disaster preparedness and educational attainment. *Journal of Emergency Management* **9**(4), 45–52.

Miceli R, Sotgiu I, Settanni M. 2008. Disaster preparedness and perception of flood risk: A study in an alpine valley in Italy. *Journal of Environmental Psychology* **28**(2), 164–173.

Mulhere K. 2017. College grads and workers are overqualified for their jobs. *Money*.
<http://money.com/money/4658059/college-grads-workers-overqualified-jobs>

Oshagbemi T. 2000. Is length of service related to the level of job satisfaction? *International Journal of Social Economics* **27**(3), 213–226.

Srinivas H, Nakagawa Y. 2008. Environmental implications for disaster preparedness: Lessons learnt from the Indian Ocean Tsunami. *Journal of Environmental Management* **89**(1), 4–13.

Wilson S, Temple B, Milliron M, Vazquez C, Packard M, Rudy B. 2007. The lack of disaster preparedness by the public and its affect on communities. *The Internet Journal of Rescue and Disaster Medicine* **7**(2), 1–8.

Wisner B, Blaikie P, Cannon T, Davis I. 2004. *At risk: Natural hazards, people's vulnerability and disasters*. 2nd ed. Routledge, London, UK.

World Bank. 2012. *World Development Report 2012: Gender equality and development*. World Bank, Washington, DC, USA.