

Occupational Safety and Health Problems and Issues of Firefighters in the Bureau of Fire Protection Region 4-A CALABARZON

Krystel P. Ballo
University of the Philippines

Abstract

Occupational safety and health problems and issues of firefighters are a timely and relevant concern that needs to be studied, as they are considered critical given the hazards and dangers of the work. This research measured the firefighters' awareness of the occupational safety and health standards, knowledge of the 2008 Fire Code of the Philippines, and knowledge of various workplace hazards, issues, and concerns encountered. All these factors were established to determine whether or not firefighters could achieve decent work based on the following four pillars, namely, worker's rights, employment, social security, and social dialogue. The research used personal interviews, surveys, ocular visits, fire code mini-exam, and compliance checklist to gather the necessary information in the quantitative and qualitative research design. It used questionnaires and interviews in a descriptive narrative form. The structured interviews and surveys were assessed and provided a description of the current safety and health conditions of the firefighters. Results show that knowledge of the occupational safety and health standards was average while knowledge of the 2008 fire code was low. Workplace concerns were on lack of health insurance, insufficiency and inappropriate sizes of personal protective equipment, unserviceable fire trucks, lack of free trainings and seminars, and lack of medical practitioners in every fire station. It is highly

Krystel P. Ballo is alumna of the University of the Philippines (UP). She finished Bachelor of Arts in Linguistics and Master of Industrial Relations, both from UP Diliman. She is currently a human resource manager and Japanese language translator in a Japanese engineering company in Makati, Philippines. Email: kpballo@gmail.com

recommended that these facilities and services, including health care insurance, be provided to firefighters, as these are necessities to enable them to have decent, safe and healthy work environment.

Key Words: Occupational Safety and Health, Firefighters, Bureau of Fire Protection, Public Safety, CALABARZON

Introduction

Being a firefighter is both a profession and a vocation. Since the nature of work is directly related to extending services and securing public safety, it is basically a 24/7 on call job requiring firefighters to be always on the go whenever duty calls. A firefighter's job is not only to stop a raging fire but also to perform rescue operations during calamities, such as typhoons, floods, earthquakes, landslides, and others. Considering the demands of the work, firefighting is undoubtedly an exhausting and hazardous job.

This study focuses on the occupational safety and health (OSH) of firefighters in the Bureau of Fire Protection (BFP) Region 4-A CALABARZON. It specifically attempted to answer the following questions:

1. What is the level of awareness of the firefighters on Occupational Safety and Health (OSH) Standards?
2. What are the potential hazards encountered in the workplace?
3. How compliant are the firefighters to the OSH Standards?
4. What are the problems and issues firefighters experience at work?
5. What are the possible recommendations to promote and ensure OSH of the firefighters?

Theoretical and Conceptual Frameworks

This study is anchored on the premise that firefighters will achieve decent work if provisions, laws, and right programs on OSH are strictly implemented and followed by BFP. According to John T. Dunlop's industrial relations (IR) systems theory (1958), management, labor, and government possess a shared ideology that defines their roles within the relationship and provides stability to the system. Hence, this study

is guided by Dunlop's IR systems theory, the concept of decent work as defined by the International Labor Organization (ILO), accident causation theory, and job safety theory.

Decent Work

Decent work, the main concept in this study, is considered as the ideology in the three main constructs of the IR systems theory that serve as the guiding principle in the implementation of OSH of firefighters. For firefighters to move in that direction, it is important for them to acknowledge the shared basic values of a safe and healthy workplace like an integrated development strategy applied to all BFP members.

Decent work is manifested in four strategic pillars: (1) employment; (2) social security; (3) worker's rights; and (4) social dialogue. It embraces safety at work and healthy working conditions as part of its 10 substantive elements (Ghai, 2002). The ILO recognizes decent work as the summation of the aspirations of working individuals. It involves opportunities for productive work that delivers a fair income, workplace security, social protection for families, better prospects for personal development, social integration, freedom for people to express their concerns, organize, and participate in the decisions that affect their lives, and equal opportunity and treatment for all women and men (ILO, 2018). Decent work is not just a concept or a notion; it is the most deeply felt aspiration of people and the way ordinary men and women express their needs in all societies, developed or developing. Decent work is the kind of work that meets the needs of their families in terms of safety and health at work in which they are treated decently and their basic rights are respected (Somavia, 2000).

Like any other ordinary workers, firefighters experience various challenges and problems on having a safe and healthy work environment, especially that their work is prone to accidents and life-threatening situations. To help these firefighters attain decent work, OSH should be properly addressed and considered.

Integrating the conceptual and theoretical frameworks, the entire concept of this research is attaining a holistic well-being and decent work for firefighters through proper implementation of OSH provisions, laws, and programs. The accident causation theory and job safety theory support the objective of the research in identifying various

causes of risks and hazards and preventions that are significantly beneficial in dealing with the high-risk and hazardous nature of work of firefighters. These two theories provide ideas and explanations on how to deal with accidents between man and machinery and provide cautions and preventions. The concept of decent work provides a clearer understanding of having a better, safe and holistic well-being of employees, especially those subjected to high-risk and hazardous work environment.

Industrial Relations Systems Theory

The IR systems theory applies a social systems analysis to industrial relations through an analytical construct that produces rules governing the production system. The three main constructs are actors, contexts, and ideologies.

Applying the said theory in the study, the actors are the firefighters, BFP, and government. The context lies in the occupational safety and health of the firefighters and other aspects, such as technological advancements, budget of the BFP, and power to fulfill their duties and responsibilities. They are bound by the ideology of achieving decent work when all these constructs positively collaborate and affect one another. BFP is a specialized governmental organization that plays a role in setting the rules for firefighting, fire and risk management, and others.

As an IR system, BFP's system is in relative equilibrium with the hierarchies of actors who are, in this case, the firefighters. Their relationship to each other is in a steady state which is operating in an environment with specified and unchanged context. This is coalesced by shared views according to their roles and generated a steady state of rules in the workplace. If we are to make some changes in BFP rules by strictly implementing the OSH with all its members targeting an internal behavior change among its firefighters and environmental change among its firefighting strategies, then the change should work throughout the entire organization, thus leading to a positive change in their approach to a safer and healthier firefighting work. It takes a system change to validate the changes in the rules of the workplace (Dunlop, 1958, p. 19) such that the implementation of OSH with firefighters can only be sustained if the channel of trainings, seminars, and constant knowledge and awareness are adjusted or become the driving force for the changes in the rules of the workplace. Strict

compliance and collaboration among IR actors are keys to achieving decent work through OSH. Compliance should consider other theories in accident causation to give more support and guidance towards achieving a safe work environment.

Accident Causation Theory and Job Safety Theory

Other essential theories that constitute the theoretical framework of this research are accident causation and job safety theories. These two theories support the importance of OSH to firefighters. With the nature of firefighting work, it is assumed that various factors affect the safety and health of these workers that hinder them from achieving decent work. Job safety involves the interrelationship between people and work; materials, equipment and machinery; environment; or economic considerations, such as productivity. Ideally, work should be healthful, not harmful and unreasonably difficult (Skiba, 2011).

Accident causation theory, developed by H.W. Heinrich in the 1930's, is described as man and machine relationship, frequency and severity relation, unsafe acts reasons, management role in accident prevention, and costs of accidents and impact of safety on efficiency. This theory deduces that 88 percent of accidents are due to unsafe acts of workers, 10 percent due to unsafe conditions, and 2 percent due to acts of God, such as natural disasters. Heinrich defines accident as "an unplanned and uncontrolled event in which the action or reaction of an object, substance, person, or radiation results in personal injury or the probability thereof" (Hosseinian & Torghabeh, 2012).

Operational Framework

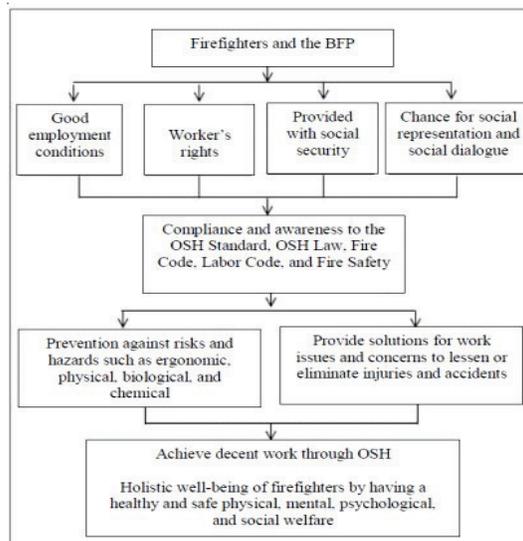
On operational framework, the four pillars of decent work, once applied by BFP with the firefighters, will prompt the latter to strictly comply with the rules and regulations set in the fire code, be aware of the OSH standards and law, and follow the fire safety code. All BFP mandates, policies, and latest information have to be properly disseminated from the top line officials at the national level down to the station level. Involving firefighters means allowing them to attend regular trainings and seminars for free to continuously broaden their knowledge and awareness about the various discussions, techniques, and strategies in firefighting, fire safety, and OSH to improve both their skills and performance.

Firefighters have to be provided with ample and proper supply of tools and equipment needed to do their job. Well-equipped firefighters will be able to safeguard their safety and health when dealing with various fire cases. Job safety and accident causation theories, once applied and incorporated into various OSH programs, policies, and plans of BFP with all its firefighters, will lead to a stronger and effective cooperative measure in their firefighting strategy. The government through BFP has to spearhead proper implementation of organizational influences on subordinates requiring good leadership and supervision capabilities, so that right tactics and strategies when dealing with high-risk work, such as serious cases of fire or other natural calamities, will be properly operationalized. Failure to provide the right command and order can lead to unsafe supervision endangering the lives of those in action.

There are different forms of active and latent failures that cause severe effects on firefighters during operations. These forms include mental fatigue and poor communication and coordination practices. If exhausted firefighters will fail to communicate and coordinate, their lives will be seriously at stake.

The end goal of this framework is to achieve a holistic well-being manifested in their OSH. This well-being covers the totality of a worker's welfare, such as physical, mental, psychological, and social aspects. In this regard, decent work would be achieved, and help increase firefighters' morale and motivation.

Figure 1. Operational Framework of Occupational Safety and Health of Firefighters



Research Design and Methods

The methodology was designed to ensure that the researcher would be able to personally see and observe the conditions of the selected stations and personnel. Instead of online surveys, an actual visit to personally hand out the questionnaires was deemed necessary to establish a more dedicated approach especially towards the respondents. The researcher's presence and explanation about the objectives of the study somehow enlightened the personnel to answer the survey as honestly as possible and provided more insights or information that contributed more to the entirety of the research. Hence, the qualitative approach was used to highlight narratives of BFP personnel and subjective experiences made through observations and interviews to produce rich and detailed descriptions of the problems and issues they encountered. Aside from accounts of respondents, BFP was kind enough to share statistics recorded by each station. Hence, the quantitative approach was used to present numerical data. In getting the demographics, SPSS was used to get the relative frequency and percent distribution. Survey results were recorded in excel where the number of responses per item and criterion was listed and percentage distribution was calculated. Mean scores were calculated to better indicate comparative results among the criteria presented.

The researcher visited selected fire stations in Naic, Carmona, Bacoor, and Trece Martires on 17 April 2019 in time for BFP's yearly *Oplan Semana Santa* to personally experience BFP's regular operations in the community. The researcher was able to observe the nature of work of firefighters in this particular event and their necessary preparations to immediately respond whenever fire breaks out. On 13 February 2019, the researcher witnessed the practice and drill for the annual national fire Olympics and attended the annual fire Olympics pageant night at Quirino grandstand.

Concepts and Indicators

The study is anchored on the premise that the independent variables, such as compliance and awareness to OSH Standards, Labor Code of the Philippines, and Fire Code of the Philippines, knowledge on the hazards and risks and solutions to the issues and problems, have significant effects on decent work of firefighters manifested physically, mentally, emotionally, psychologically, and socially.

Research Instruments

In order to test the effects of the independent variables on the dependent variable (OSH), the research conducted a structured survey using a customized questionnaire to determine the general perceptions on the risky nature of work and coping mechanisms. In addition, testimonials and narratives from firefighters were included through personal interviews. Given lack of a questionnaire specifically designed for firefighters, the questions were crafted to fit the nature of work of firefighting and to meet study objectives.

The first survey questionnaire was designed to measure the awareness and knowledge of firefighters of various BFP safety programs and OSH standards compliance. The questionnaire was divided into four categories: (1) safety program; (2) injury/incident reporting and safety performance; (3) participation; and (4) training. Respondents were instructed to answer yes or no sets of questions in every category. The other instrument was designed for interviews with randomly selected firefighters and officers. The interview was composed of 31 questions on issues and concerns in the firefighting industry. The purpose of the interview was to get further explanations and discussions which the survey results could not provide. Personal conversations with firefighters allowed for follow-up questions and verifications. An ocular checklist was used to check and inspect stations and living quarters on compliance with basic and important safety procedures and implementation for the safety and health of firefighters. To check if firefighters were knowledgeable about the Philippine fire code, the researcher prepared a 27-item test. Actual observations during operations were conducted with permission from firefighters and officer-on-duty.

Units of Analysis and Sampling

Study respondents were firefighters specifically from the BFP Region 4-A CALABARZON. They were from Cavite (BFP Naic, BFP Bacoor, BFP Carmona, and BFP Trese Martires), Laguna (BFP Regional Head Office in Camp Vicente Lim, BFP San Pedro, BFP Cabuyao, BFP Sta. Rosa, and BFP Calamba), Batangas (BFP Malvar, BFP Mataas na Kahoy, BFP Bauan, BFP Batangas City, and BFP Lipa), and Rizal (BFP Rodriguez, BFP San Mateo, and BFP Taytay). The researcher conducted interviews with firefighters through random sampling. Personal interviews were carried out in April 2019. BFP stations cited above

were chosen to be the subject of study given the researcher's established connection in these stations.

Usual number of firefighters in each station was ten 10. Since the number of respondents depended on the number of firefighters in the station, the researcher decided to have at least four respondents in each station. However, since some stations had more available firefighters on duty during the visit, the researcher decided to include additional firefighters in the study. More respondents were accommodated for higher probability for data results to truly represent varying opinions of sample population. This study had a total of 110 respondents.

Data Gathering

Prior to conducting personal interviews and surveys, the researcher sent a formal request letter to the regional director of BFP Region IV-A through the assistant regional director for administration for approval to conduct said interview and survey with their personnel. Another formal request letter was sent to the assistant regional director for operations for data and statistics. Upon approval of the request, a memorandum, requesting all selected fire stations to cooperate and actively participate in the research, was issued to all provincial fire marshals of Cavite, Laguna, Batangas, and Rizal on 7 March 2019.

During visits to the fire stations, the researcher presented a copy of the memorandum to the fire marshals or officers-on-duty. Before administering the survey questionnaires and conducting interviews, the researcher introduced herself as a graduate student from the University of the Philippines School of Labor and Industrial Relations by presenting her student ID and explaining to them the research purpose and objectives. On ocular checklist, the researcher explained the necessity of conducting the inspection and asked proper permission from firefighters on duty to have access to their barracks or living quarters. The researcher assured the respondents that all information would be strictly used for research purposes and their identities would be kept confidential should they request not to disclose their personal information. Target respondents were BFP hired personnel with experience in responding to fire incidents or calamities. A simple random sampling was used in selecting target respondents because of the small population of each station and not all firefighters were in the station every day given their varying shifts. For personal interviews, target informants were higher-ranked officials and regular firefighters from each station to know the different views and opinions of fire

officials and regular firefighters. Years of work experience was also considered, as veteran firefighters had more involvement than the new ones. The researcher personally administered survey questionnaires to the respondents; she collected them back once they had finished answering the questionnaire. Aside from surveys and interviews, actual records and documents of fire and calamity cases or firefighter accident reports were gathered and analyzed to provide comparative data results among the fire stations under study.

Data Analysis

Data results were presented in tabular forms and graphs for easier interpretation. The answers on the “Knowledge on the Fire Code of the Philippines” questionnaire were tabulated using excel and percentage of the scores were taken. An 80 percent passing rate was set. A passing rate would mean that they were knowledgeable of the Philippine fire code and a failing rate would mean they had limited or insufficient knowledge of the code and they needed a refresher course. Results of the ocular checklist and survey on safety standards, incident reporting, and training were tabulated using excel, as answers involved affirmation or negation only. Analysis was based on the percentage of affirmative versus negative answers. Negative answers were deemed as probable causes of accidents that needed to be further attended to. Interview and document analysis were presented in a descriptive narrative form. Verbatim responses on sensitive issues were used to avoid misinterpretation and misquotation.

Results and Discussion

Decent work is the main concept in this study serving as the guiding principle in the implementation of OSH of firefighters. Results and discussion tackles the four strategic pillars mentioned earlier to see if these were being applied to the integrated development strategy of BFP. Data gathering was conducted on a weekend and a holiday. Hence, only a few firefighters were on duty. Nonetheless, the researcher was still able to gather a total of 110 respondents, majority (87) of whom are males. The rest (23) are females. Table 1 below shows the sociodemographic characteristics of the respondents indicating the age, gender, marital status, rank and position, and length of service in frequency and percent distribution. It is noted that age limit for firefighters is 20 – above 50, just before the retirement age of 55 years

old. Most respondents had fire officer 1 rank and were between 20 and 30 years old. It was observed that the stations were dominated by lower ranking positions and the number of higher-ranking positions, particularly senior fire officer, was lesser. This is the reason most respondents were new to the service. Sixty respondents, or 54.5 percent, had 0.5 - 5 years of work experience in BFP.

Table 1. Relative Frequencies and Percent Distribution of Socioeconomic and Demographic Characteristics of Firefighters

Characteristics	Categories	Frequency (N=110)	Percent Distribution (N=110)
Age	20 - 30	51	46.4
	31 - 40	43	39.1
	41 - 50	11	10.0
	51 and above	5	4.5
Gender	Male	87	20.9
	Female	23	20.9
Rank	FO1 ¹	61	55.5
	FO2	13	11.8
	FO3	13	11.8
	SFO1 ²	11	10.0
	SFO2	9	8.2
	SFO3	1	0.9
	SFO4	1	0.9
	SInsp ³	1	0.9
Marital Status	Single	46	41.8
	Married	64	58.2
Length of Service	0.5 - 5	60	54.5
	6 - 10	23	20.9
	11 - 15	14	12.7
	16 and above	12	10.9

The researcher was only able to get one senior fire officer 3, one senior fire officer 4, and one senior fire inspector as respondents. The chief fire marshal does not stay in the station all the time, as it is the protocol of the station to designate an officer-in-charge, the officer-of-the-day, to lead the station in the absence of the fire marshal.

On marital status, majority, 64, were married while the rest, 46, were single. Most single respondents were newly hired while most married respondents had spent a significant number of years in the service.

¹FO – Fire Officer

²SFO – Senior Fire Officer

³SInsp – Senior Inspector

Level of awareness of firefighters on the OSH Standards

Awareness of respondents on OSH standards is an important aspect of their work. Collaboration between the OSH Center and BFP in October 2015 on the fire safety training for fire safety practitioners was a heads up to BFP members about OSH (BFP, 2015).

Table 2. Percentage of Awareness on the Safety Programs Provided by the Bureau and the Station

CRITERIA	Yes	No	No Answer
1. The station has a Health and Safety Policy.	64.5	34.5	0.9
2. The station has a written safety program, OSH Manual or Safety Management System.	59.1	40.0	0.9
3. Manual is available to the firefighters.	55.5	43.6	0.9
4. An OSH copy of the manual is kept at the work site.	60.9	39.1	-
5. The health & safety responsibility is part of job/position descriptions.	88.2	10.0	1.8
6. Assignations, designations and appointments are in place, relevant, and up-to-date.	90.0	10.0	-
7. Has a system for keeping up-to-date with the Occupational Safety and Health and its Regulations.	58.2	41.8	-
8. Has up-to-date Material Safety Data Sheets (MSDS).	60.9	38.2	0.9
9. MSDS is discussed with the relevant workers.	66.4	32.7	0.9
10. The station has Safety Committee/ Safety Representative(s).	80.0	20.0	-
11. The station conducts project or work site safety inspections.	90.0	9.1	0.9
12. Has a system for inspecting plant, tools and equipment prior to entry to site and while they are on site.	78.2	21.8	-
13. Approved personal protective equipment has been issued and the wearing thereof been enforced.	92.7	7.3	-
14. Has a registry of hazardous substances.	73.6	25.5	0.9
15. Has a system for conducting risk assessments.	80.0	18.2	1.8
16. Has a system to manage hazardous substances.	77.3	20.4	1.8
MEAN	(73.5)	(25.8)	(1.2)

Based on results shown in Table 2, firefighters seemingly had little awareness and knowledge of OSH, as 40 percent answered no. During the actual data gathering, a number of firefighters asked the researcher about OSH. Such shows that OSH had not been thoroughly introduced to them and that a number of firefighters had not been aware of such standards. If they were to be rated, their level of awareness would be 60 percent. This percentage is not high considering that OSH is a critical element in their work.

Table 3. Percentage of Awareness on Training and Induction Programs

CRITERIA	Yes	No	No Answer
1. Has a program for regular training on Health and Safety.	77.3	22.7	-
2. Has an induction program for employees.			
2.1 Personal Protective Equipment	90.9	9.1	-
2.2 Fire protection	97.3	2.7	-
2.3 First aid facilities	88.2	11.8	-
2.4 Emergency procedures	92.7	5.5	-
2.5 Hazardous substances	65.5	33.6	0.9
2.6 Confined spaces	75.5	24.5	-
2.7 Working at Heights	78.2	21.8	-
2.8 Signs, barricades, flagging	84.5	11.8	3.6
2.9 Electrical safety	78.2	21.8	-
2.10 Rigging and crane safety	48.2	50.9	0.9
2.11 Incident/Injury Reporting	82.7	17.3	-
2.12 Consultation Process	73.6	25.5	0.9
3. Has a system for recording training, qualifications, competencies and licenses of its employees.	89.1	10.0	0.9
4. Has a program for newly hired or promoted firefighters.	92.7	7.3	-
4.1 OSH Regulation & Duty of Care	60.0	37.3	2.7
4.2 Safe work practices	86.4	13.6	-
4.3 Safety supervision	89.1	10.9	-
4.4 Emergency procedures	90.0	10.0	-
4.5 First aid procedures	96.6	6.4	-
4.6 Equipment inspection procedures	90.0	10.0	-
4.7 Injury/incident investigation	87.3	12.7	-
4.8 Fire protection and prevention	93.6	6.4	-
4.9 Lock out/tag out procedures	82.7	16.4	0.9

On training and induction programs, majority agreed that these were already being implemented in their respective stations. However, this still does not guarantee an optimum satisfaction of the standard requirement, as a significant number of them answered no in the survey. Results for items from 2.1 to 2.12 indicate an undesirable impression against BFP, as the items listed were supposedly basic programs every firefighter must know and learn. Item 2.10 on rigging and crane safety had a significantly higher no results at 50.9 percent than yes results at

48.2 percent. Firefighters should have ample knowledge of and training in rigging and crane safety, especially that structural formations of buildings are mid-rise and high-rise. Danger in dealing with heights is not easy to handle.

Another important aspect to look into is item 4.1 on OSH legislation and duty of care. Sixty percent answered yes, 37.3 percent answered no, and 2.7 percent had no answer. It is important to note this data, as OSH legislation and duty of care should be part of the introductory course for newly hired firefighters. Upon joining BFP, each new member needs to know and learn everything about OSH.

Table 4. Employment, Social Security, Worker’s Rights, and Social Dialogue

CRITERIA	Yes	No	No Answer
1. Meetings are held on a regular basis and are structured.	91.8	8.2	-
2. Has a regular Health and Safety Meetings.	56.4	43.6	-
3. Has a chance to voice out opinions during meetings or talks.	88.2	11.8	-
4. Can defend interests and engage in discussions to negotiate work-related matters within the station or in the BFP.	89.1	10.9	-
5. Actions are taken regarding matters discussed at the Health and Safety Meetings.	77.3	22.7	-
6. Have set up a system to consult with the station members regarding Health and Safety matters.	70.0	30.0	-
7. Salary is appropriate and adequate to the kind of job they are doing.	91.8	8.2	-
8. Satisfied with salary and other benefits at work.	92.7	7.3	-
9. Satisfied with work shift.	95.5	4.5	-
10. Amenable to work overtime especially on the night shift.	99.1	-	0.9
11. Feels safe and secure with the kind and nature of work.	84.5	14.5	0.9
12. Provided with sufficient medical care and contingencies such as sickness, accident, death of the principal breadwinner, disability, old age.	74.5	25.5	-
13. Satisfied with medical care and contingencies.	69.1	30.0	0.9
14. Allowed to take a long absence from work for vacation or other purposes.	51.8	48.2	-
15. Given enough rest and recuperation with remuneration whenever injured or sick.	90.0	10.0	-
16. Provided with adequate and primary health care such as clean water, sanitation, and shelter.	95.5	4.5	-
17. Feels any discrimination at work.	13.6	86.4	-
18. Feeling of being forced to do work.	11.8	88.2	-
19. Denied equal treatment and opportunities at work.	13.6	85.5	0.9
MEAN	(71.4)	(28.4)	(0.9)

Table 10 shows the results that pertain to the four pillars of decent work. It is important to know if firefighters met and enjoyed these pillars. Ratings of 88.2 percent and 89.1 percent in items 2 and 3, respectively, show that firefighters were given opportunities to voice out their opinions and defend their interests. However, in interviews, respondents shared that they were given such opportunity to be heard but higher officers had the final decision and answer. For instance, a primary concern of stations was insufficiency of PPE and firetrucks. The municipal or city fire marshal would report such concern to their immediate superior who, in turn, would raise the matter to the region. Depending on assessment and need, the request could either be granted or disapproved.

At the municipal or city level, some LGUs were keen on supporting fire stations in their areas. Fire stations with supportive LGUs were seen as fortunate, because not only were they provided assistance and funds for their projects but also given opportunities to represent BFP in meetings conducted by political officials to develop programs in line with their political platforms and agenda. This way, BFP and LGU were able to establish good relationship that would help improve the place. A concrete example is the Bacoor fire station. It had the most sophisticated and state-of-the-art facility compared to the other stations. The government of Bacoor incorporated a one-stop government office in a single compound to help its constituents process their transactions easily. The said compound holds the fire station, police station, city hall, labor and employment department office, education department office, and land transportation office. The LGU provided a good location and building for BFP Bacoor for which station members were grateful.

On employment, BFP usually would post a hiring ad in accordance with the memo from the head office. Applicants would submit their applications and the region would screen and select candidates for the qualifying exam, especially given a required quota. If an applicant would successfully pass the exam, he or she would undergo an agility test and panel interview for the next selection process. Once hired, he or she would receive an appointment signed and attested to by the civil service commission, thus would become an official BFP member.

Newly hired members would undergo a 6-12 month probationary period and a fire basic recruit course prior to regularization.

On work shift, each station would designate its own work shift. For instance, high ranking officers in the region could have an 8 am - 5 pm daily shift. At the stations, depending on the fire marshal, the shift could be two days off and two days duty, or three days off and three days duty. This means that a firefighter should be on duty for 24 hours for two or three consecutive days, and could have his/her day off for two or three consecutive days as well. Living quarters or barracks were provided in the stations for firefighters to stay in while on duty. However, whenever a fire incident would be declared as third alarm or fourth alarm, those off duty should respond to the fire case. They could resume their day off after the case was declared fire out. Normally, firefighter would go on a buddy system. They were trained to always go in pairs wherever they would go and whatever they would do. Given the round the clock manning of the station, a pair could take turns in sleeping whenever on duty to ensure enough rest for each one.

On salary and allowances, a great majority or 92.7 percent agreed that they were being paid well and the amount was commensurate to their kind of work, as BFP strictly followed the salary standardization law for government employees. They received hazard pay and other allowances. However, on benefits, they were looking forward to health insurance or medical assistance for their medical and hospitalization needs. They had annual medical check-ups but they were not so thorough as they expected.

On vacation leaves, majority or 51.8 percent believed that they were allowed to take long leaves while 48.2 percent believed they were not allowed. They confirmed that they could not take long vacations anytime, especially for overseas trips. They had to have their leave requests approved by their immediate superior and/or secure a travel order from high-ranking officials. They could face sanctions if they defied such rule. They could be off-loaded at the immigration when traveling without a travel order.

In case of injury or hospitalization, they received ample time to recuperate without compromising their compensation. BFP was quite considerate in providing sufficient rest and recovery days for affected personnel.

On discrimination, forced labor and unjust treatment, majority agreed that they did not have such issues at work. However, a significant number indicated that such issues were important and needed to be considered and properly addressed, thus implying that some firefighters faced such issues.

BFP recognizes women empowerment with its appointment of a number of women fire marshals in various cities and municipalities across CALABARZON. High-ranking positions are not exclusively for men firefighters given the significant number of women with senior fire officer positions. Most stations in this study had women fire marshals.

On the issue of forced labor, given the hierarchical nature of BFP and rule of seniority, some firefighters felt like they were being forced into labor, as they must strictly obey the order and commands of their superiors or be accused of insubordination, thus compromising their jobs.

Hazards encountered in the workplace

Firefighting is categorized as hazardous work. Hazards can be categorized as chemical, physical, biological, psychological, and ergonomic (Guidotti & Clough, 1992). Hazards due to ergonomic problem involve badly designed machinery, substandard tools and equipment, improper workstation design, and poorly designed workplaces. Insufficient supply of ventilation to workplaces and even in the living quarters can cause bad effects on health, such as high blood pressure. It creates an uncomfortable feeling affecting work mood and attitude. Substandard PPE and self-contained breathing apparatus (SCBA) can cause the lives of firefighters during operations. Unserviceable and broken down fire trucks can hinder firefighters to do their work and can even lead to road accidents.

Table 5. Percentage of Exposure to Work Hazards and Risks

CRITERIA	EXTREME	MODERATE	SLIGHT	NO ANSWER
1. Exposure to heat when responding to fire cases.	23.6	45.5	30.0	0.9
2. Temperature extremes that could affect the equipment or materials.	30.0	48.2	20.9	0.9
3. Exposure to too much radiation.	19.1	30	50.0	0.9
4. Exposure to work that could affect vision.	26.4	41.8	30.0	0.9
5. Exposure to too much smoke.	51.8	39.1	8.2	0.9
6. Exposure to too much chemicals from smoke.	36.4	37.3	25.5	0.9
7. Inhalation or absorption of too much smoke or chemicals.	28.2	40.0	30.9	0.9
8. Sickness caused by inhalation of smoke or chemicals.	70.0	17.3	8.2	4.5
9. Burns from fire rescues.	6.4	13.6	74.5	5.5
10. Accident/injury in one of your operations.	8.2	17.3	69.1	5.5
11. Risks from threats or violent attacks from the public.	12.7	23.6	59.1	4.5
12. Tasks are evenly distributed to prevent one individual from experiencing work overload.	15.5	50.9	30.9	2.7
MEAN	(27.4)	(33.7)	(36.4)	(2.42)

Table 5 presents the degree of exposure to hazards and risks firefighters experienced every time they responded to fire and other emergency cases. Overall results show that mean percentage for slight exposure had the most number of responses at 36.4 percent, moderate at 33.7 percent, extreme at 27.4 percent, and no answer at 2.42 percent. Results imply that most firefighters felt safe, as most considered their exposure as minor. However, it is important to note the minimal difference between slight and moderate at 2.7 percent and between slight and extreme at 9 percent. These minimal differences can be interpreted as huge threats to firefighters' well-being—firefighters were not 100 percent secure and safe in their work, as they were often subjected to extreme working conditions detrimental to their well-being.

On items 5 and 8 on exposure to too much smoke, extreme had the most number of responses at 51.8 percent and 70 percent, respectively. These results can be validated with the results of the ocular checklist and interviews with high-ranking officers in which they acknowledged that they had insufficient supply of SCBA. Insufficiency of SCBA and other PPE made them feel they were heavily exposed to smoke. The

ratio of SCBA to firefighters was not 1:1. hence, responding firefighters tended to take turns in using the same SCBA. In huge fire cases where all firefighters were expected to respond, some firefighters became heavily exposed.

On burns and injuries, majority of respondents answered slight. This result can be explained by firefighters always making sure they had presence of mind in responding to cases on site. They strictly followed the order and command of the ground commander before they took appropriate actions. Firefighters were well trained to act accordingly and not abruptly.

There had been cases when the crowd created a commotion by attacking firefighters. Due to lack of knowledge and awareness about firefighting techniques, fire victims tended to go rowdy and steal the hoses from firefighters and put off the fire themselves fearful that the fire would gut their house if firefighters would not train the hose toward it. They tended to get injured in the process but firefighters were trained to control the crowd and understand the emotions of the victims. They usually encountered such situation in slums or with informal settlers. Another problem was difficulty in penetrating affected areas without enough space for vehicles or firetrucks. Firefighters found it unacceptable to be accused of not doing their job for responding late and not being able to provide more water. They did everything they could to save lives and properties but the narrow space and unruly crowd kept them from getting the job done. Lack of rescue equipment and machineries was also a major reason they could not fully perform their job. Amid such problems, they made adjustments, thought of resources, and implemented strategies to enable them to do their job and serve the people. They said they were unconsciously being trained to be resilient and resourceful. Nothing could stop them from helping others no matter the situation.

Alli (2001) says private and public workplaces at the national and international levels have raised concerns on all aspects of human, social, and economic costs of occupational accidents, injuries, diseases, and major industrial disasters. Different measures and strategies have continuously been specifically designed and developed over the years to prevent, control, reduce, or eliminate occupational hazards and risks and keep pace with technological and economic changes. However, despite these developments, occupational accidents and diseases still recur, thus, increasing costs in terms of human suffering and economic burden.

Compliance of firefighters with OSH Standards

In general, BFP CALABARZON was compliant with OSH standards as the fire code requires. However, there were instances where it failed to methodically follow some rules, specifically on proper wearing of required uniform or attire while on duty at all times even on holidays and weekends. Per observation, some stations were not keen about following this rule.

Rules 9 and 10 of the fire code on enforcement and administration of fire safety measures are in line with three rules stipulated in the 2017 OSH standards manual: (1) 1070 on occupational health and environmental control; (2) 1080 on PPE and devices; and (3) 1960 on occupational health services.

Rule 1070 focuses on the threshold limit values⁴ for toxic and carcinogenic substances and physical agents present in the atmosphere of the workplace. It involves permissible noise exposure; illumination and lighting; ventilation, such as air supply, atmospheric conditions, cleanliness, air movement, temperature and humidity; and working environment measurement. such as maintenance and control of workplace in comfortable and good conditions to maintain the health of workers. Looking at the firefighters' workplace, all these threshold limit values seemed to have been overlooked, as firefighters were subjected to extreme conditions. They were heavily exposed to toxic substances in the atmosphere of burning structures; exposed to too much noise of the siren and the people's cry; extreme lighting for fire exposure and poor lighting for rescues of collapsed buildings; and poor ventilation for lack of SCBA and inappropriate PPE. Moreover, they had poor living conditions with poor ventilation, small spaces, and untidy surroundings in their quarters or barracks.

Rule 1080 is on the PPE and devices. It stipulates:

“... furnish his workers with protective equipment for the eyes, face, hands and feet, protective shields and barriers whenever necessary by reason of the hazardous nature of the process or environment, chemical or radiological or other mechanical

⁴Threshold limit values refer to airborne concentration of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed daily without adverse effects (OSH Standards, 2017).

irritants or hazards capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact. All personal protective equipment shall be of the approved design and construction appropriate for the exposure and the work to be performed” (OSH Standard, 2017).

Firefighters were non-compliant with the above-mentioned rule, particularly on having appropriate PPE against exposure to toxic substances. They did not have enough supply of PPE for the eyes, hands and feet, protective shields and barriers. Hence, they had high exposure to hazardous irritants causing injury or impairment.

Rule 1960 on occupational health services focuses on having a health service in the workplace for the purpose of establishing and maintaining a safe and healthy working environment to facilitate optimal physical and mental health in relation to work. This entails the engagement and presence of occupational health personnel, such as nurse, dentist, doctors, and first-aiders, to provide occupational health services in the workplace. It is noted BFP had yet to provide private health insurance to their members at the time of the study. Firefighters personally shouldered all expenses for check-ups, hospitalization, and annual physical exam. If Rule 1960 would be strictly followed, all fire stations would have their own doctors or nurses on stand-by all the time. Not all fire stations had an emergency rescue team with first-aiders. Stations with no rescue team had no immediate occupational health personnel.

Problems and issues firefighters experience at work

Health Insurance

Health insurance is a necessity and hugely beneficial to firefighters. With their kind of work, they need regular general physical exam. No matter how small or big their injury, they need proper medication and treatment from health professionals. Without health insurance, firefighters are burdened with high cost of medical check-ups, professional fees, and medications.

Insufficiency or lack of station doctors, nurses, and free annual check up

Insufficiency or lack of medical personnel in the fire stations was a major concern for firefighters. Lack of a private health insurance could be addressed if stations had medical personnel firefighters could consult anytime for free. Therefore, there is a need for at least one medical personnel in each station. Check-up for minor or major injuries, simple trauma debriefing, or psychological examination can help stabilize the physical, mental, and psychosocial conditions of firefighters always subjected to extreme conditions.

Insufficiency of PPE, SCBA, and fire trucks

PPE, SCBA, and fire trucks are the main tools and equipment of every firefighter. Lack of any of these hampers the effectiveness of their work operations and increases their exposure to danger. PPE provided were not appropriate to the sizes of firefighters. SCBA were not enough for members of the station. Some fire trucks were unserviceable.

Conditions in Fire Stations and Barracks

Design and layout of most fire stations visited were not in accordance with required standards. Some were too small to accommodate firefighters in a meeting. The place was crowded with file cabinets, tables, and chairs leaving limited space for staff to move around. It somehow looked like a pigeon hole. Some stations had uninviting façade and entrance; they did not look like a fire station at all. For instance, San Pedro fire station looked like a warehouse. It had no proper ventilation; occupants seemingly were inside an oven. It had no appropriate entrance and exit for easier and faster route of fire trucks during emergency responses. Its ceilings had holes due to worn out plywood. Its floor tiles were broken and its toilet was unclean. Another station looked like a stockroom because of its small space that could not even accommodate file cabinets. The fire marshal's office was quite small – one could only stand or sit inside.

Another important concern was most fire stations did not own the land on which they stood. Hence, they were always threatened with forced eviction or relocation by the owner. Some stations, however, were fortunate to have heavy support from their LGU. Their LGU provided the land, building, fire trucks, and equipment.

On living quarters or barracks, some stations had no proper ventilation and air conditioning system. Given the structure of the station, it could become too hot in the afternoon or in the evening, thus affecting the quality of rest of firefighters. The dining and kitchen of some stations were unhygienic, as the location was near the entrance where other materials and equipment were stored.

Recommendations and Implications

Theoretical Issues

This research suggests that in the aspect of decent work, OSH should be a major consideration for firefighters to achieve a holistic well-being at work. In conclusion, the concept of decent work (Ghai, 2002), and job safety and accident causation theories (Skiba, 2011), have been validated based on the overall results of the study. Current issues and problems of firefighters could be addressed if they would be provided with “promotion and maintenance of the highest degree of physical, mental, and social well-being of workers in all occupations; the prevention among workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological equipment” (Del Prado-Lu, 2011, p. 5).

Methodological Issues

This research is dominantly descriptive in nature. Hence, presentation of the data gathering results only shows the characteristics of firefighters and phenomenon under study. Simple random sampling was used in selecting survey respondents. Negative outcomes were observed, as some respondents did not thoroughly read each set of questions. They immediately put a check mark without considering the yes or no column. Therefore, it is highly suggested to prepare a concise set of questions, so that respondents would not take too much time in answering it. Multiple sub-questions should be lessened or avoided as they create confusion among respondents. Since the survey used close-ended questions, yes or no answers of respondents could not be qualified or explained. Nonetheless, the overall result of the survey was satisfactory, as the number of respondents reached more than a hundred. This implies that it is always advisable to get a high

number of target respondents in surveys to ensure the reliability of the results. If possible, an electronic or online data gathering method, such as Google docs, be used, as it gives error messages whenever an item is not answered properly. It can also generate results more accurately and efficiently, as all answers can be summarized quickly unlike in manual distribution of survey papers.

On the fire code exam, the overall result was not satisfactory, as some respondents copied each other's answers resulting in similar overall scores. Should this study be pursued using the same method of conducting a mini exam, it is suggested to strictly instruct respondents to answer on their own and not compare answers with others. The exam results could not fully justify the lack of knowledge of firefighters of the fire code given the respondents' similar scores.

Practical and Policy Issues

Information on OSH of firefighters in the BFP CALABARZON is seen as practical, as study results could be forwarded to the regional office for recommendation purposes. Findings could be used by higher officials as bases for creating programs and policies to improve the working conditions of firefighters.

First, it is highly recommended that firefighter be given free trainings and seminars about OSH standards. These trainings should be given for free to all firefighters in all fire stations and not just in stations situated in fire-prone areas, such as cities and industrial areas.

Second, issuance and provisions of PPE, particularly SCBA, should be prioritized, as they are supposed to be the most basic and important equipment every firefighter must have. Sizes of the PPE should be in accordance with the size of the user. If the size does not fit, user cannot move freely and properly.

Third, it is highly recommended that BFP provides an HMO or medical health insurance to each firefighter. The hazardous and risky nature of work requires them to be always mindful of their physical and mental health. Their mental health should always be monitored should trauma debriefing and psychiatric medications would be needed. Provision of an HMO would alleviate their burden from paying their medical bills from their own pockets.

Fourth, BFP should shoulder the cost of the annual physical exam, as this is a requirement to all its members. Fees and other expenses for x-rays, urinalysis, fecalysis, and dental check-ups should be waived. Incidentally, an HMO would cover such tests.

Fifth, if an HMO provision would not be feasible, BFP should consider providing medical practitioners, such as nurses and doctors, in every fire station or at least in every city or municipality, so that the health of every firefighter could be regularly monitored. Firefighters wanted thorough medical check-ups. Engaging doctors available round the clock for free consultations would be a big assistance to them.

Sixth, BFP should consider offering security of tenure to members disabled from major injuries and accidents during operations. Instead of offering total disability force retirement, disabled members could be offered administrative or office work.

Seventh, BFP should provide better working stations and barracks. Some fire stations visited were in poor condition, almost unlivable, due to limited space, poor ventilation, and untidy surroundings.

Last, fire trucks, hoses, nozzles, and other equipment should be up-to-date and state-of-the-art to ensure better work performance and safety of users. Durable and effective equipment motivate firefighters to perform better.

The concept of OSH should not be taken for granted, as firefighters are expected to be first in line to perform rescues. If they could not maintain and secure their own safety and health, how could they assure the common masses of their safety?

References

- Alli, B. O. (2001). *Fundamental principles of occupational health and safety*. Geneva: International Labour Office.
- Del Prado-Lu, J.L. (2011). *Basics of occupational health and safety: guidebook for practitioners and industries*. Quezon City: University of the Philippines Press.
- Dunlop, J.T. (1958). *Industrial Relations Systems*. Massachusetts: Harvard Business School Press.

- Ghai, D. (2002). Decent work: Concepts, models, and indicators. *International Institute for Labor Studies*. http://hdrnet.org/131/1/Decent_work_concepts_models_and_indicators.pdf
- Guidotti, T.L. & Clough, V. M. (1992). Occupational health concerns of firefighting. Occupational health program. *Annual Review. Public Health*. 1992 (13). 151-71. <https://www.annualreviews.org/doi/pdf/10.1146/annurev.pu.13.050192.001055>
- Heinrichs, M., Wagner, D., Schoch, W., Soravia, L.M., Hellhammer, D.H., & Ehlert, U. (2005). Predicting posttraumatic stress symptoms from pretraumatic risk factors: A 2-year prospective follow-up study in firefighters. *AM J Psychiatry*. 162, 2276-2286. <https://ajp.psychiatryonline.org/doi/pdf>
- Hosseinian, S. S., & Torghabeh, Z.J. (2012). Major theories of construction accident causation models: A literature review. *International Journal of Advances in Engineering & Technology*. 4 (2), 53-66. <http://citeseerx.ist.psu.edu/viewdoc/download?Doi=10.1.1.668.8949&rep=rep1&type=pdf>
- International Labor Organization. (n.d.) Introduction to occupational health and safety. http://Training.Itcilo.It/Actrav_Cdrom2/En/Osh/Intro/Inmain.Htm
- Skiba, R. (2011). Theoretical principles of job safety. ILO. *Encyclopedia of Occupational Health & Safety*. <http://iloencyclopaedia.org/part-viii-12633/accident-prevention/92-56-accidentprevention/theoretical-principles-of-job-safety>
- Somavia, J. (2000). *Perspectives on decent work. Statements by the ILO Director-General*. Geneva: ILO Office.