International Journal of Science and Research Archive
eISSN: 2582-8185
Cross Ref DOI: 10.30574/ijsra
Journal homepage: https://ijsra.net/

(RESEARCH ARTICLE)

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Assessing the fire safety practices in private schools of Quezon city

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International Journal of Science and Research Archive, 2025, 16(03), 187–201

Publication history: Received on 25 July 2025; revised on 29 August; accepted on 01 September 2025

Article DOI: https://doi.org/10.30574/ijsra.2025.16.3.2523

Abstract

This study assessed the implementation of fire safety practices in selected private schools in Quezon City, Philippines. Using a descriptive survey design, 197 teaching and non-teaching personnel from seven schools were randomly sampled from a population of 392. A validated questionnaire measured implementation across fire safety practices, disaster management structures, and equipment readiness using a 4-point scale. Results show that core practices are generally fully implemented (overall $\bar{x}$ = 3.62), with highest ratings for easy-to-open doors and windows ($\bar{x}$ = 3.94), timely repair of defective electrical components ($\bar{x}$ = 3.86), the presence of fire escape plans, proper receptacles, and regular fire drills (all $\bar{x}$ = 3.76). Disaster Management Committees are also fully implemented (overall $\bar{x}$ = 3.66), informing personnel of plans and convening at least annually. In contrast, substantial equipment gaps persist: many schools lack fire blankets (73.60%), sand buckets (69.04%), sprinklers (60.91%), heat/smoke detectors (44.16%), and hoses/nozzles (43.65%). The findings indicate strong organizational and procedural compliance but insufficient physical protection systems, suggesting partial risk exposure despite adherence to RA 9514. Recommended actions include prioritizing active (alarms, detectors, sprinklers) and passive (egress, signage) protection upgrades; formal designation of fire safety officers; intensified electrical inspections; regular drills across the school year; and structural improvements (outward-swinging doors, dual exits in classrooms and laboratories, unobstructed egress). Strengthening equipment readiness will align practice with policy and enhance life safety and resilience in private schools.

Keywords: Fire safety; Private schools; Quezon City; Disaster Management Committee; Equipment readiness; RA 9514 (Fire Code of the Philippines); Descriptive survey; Emergency preparedness.

1. Introduction

Fire safety in schools is crucial for the well-being of students and staff. It involves a combination of fire prevention, detection, and emergency response measures. Key aspects include proper storage of flammable materials, regular fire drills, and functioning fire detection and suppression systems.

Fire safety is the collection of procedures used to avoid or delay the occurrence of fire, control its spread and consequences, and minimize damage from unintentional or intentional fires. The goal of this study is to determine the level of implementation of the fire safety practices in selected private schools of Quezon City.

According to Encyclopedia Britannica, fire is the rapid burning of combustible materials with evolution of heat and is usually accompanied by flame. Fire is considered a need for daily life. Fire is sometimes a big help when it is used on good terms, but it becomes disastrous once left behind. Fire is a secondary hazard among major disasters that threaten public security. It usually takes place with enormous economic losses and casualties of personnel. It is considered an adverse event with tangible cost to property and human life.

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Fire safety is a critical aspect of modern life, impacting residential, commercial, and industrial settings. Understanding the evolution of fire safety practices and regulations is essential for effective risk mitigation and emergency preparedness. This paper provides a comprehensive overview, beginning with a historical exploration of major fire incidents and their influence on shaping contemporary fire safety codes and standards. The legal and regulatory framework governing fire safety at local, national, and international levels is examined, emphasizing the pivotal role of organizations in establishing and enforcing standards. To comprehend the dynamics of fire, fundamental concepts of fire science, such as the fire triangle and stages of combustion, are introduced. Additionally, common causes of fires, ranging from electrical faults to human-related factors, are discussed. This paper further explores the array of fire safety equipment and technologies, including traditional fire extinguishers and emerging innovations. Human behavior's impact on fire safety and the importance of well-defined evacuation procedures are examined, underscoring the critical role of emergency response planning. A global perspective on fire safety practices offers insights into diverse approaches adopted by different countries. As the foundation for subsequent chapters, this sets the stage for an in-depth exploration of fire safety in diverse contexts, aiming to contribute to the ongoing discourse on effective fire prevention and response.

A significant fire incident occurred at San Francisco High School in Quezon City, just before the start of the school year 2025-2026. The fire, which broke out on June 15, 2025, destroyed 10 classrooms, affecting 720 students and causing an estimated PHP 3 million in damages.

In December 2024, a fire broke out at a five-story school building at the corner of Scout Reyes and Scout Fuentabella Streets in Barangay Paligsahan, Quezon City. The Bureau of Fire Protection (BFP) said the incident started at about 12:47 p.m. on the second floor of Piagetian Guided Educational Center. The school offers Preschool to Grade 8 levels of education. Estimated cost of damages is P300,000.00 (PNA, 2024)

On May 9, 2024, the canteen of Ernesto Rondon High School in Project 6, Quezon City, caught fire. The fire allegedly ignited from piles of papers in the canteen (Inquirer.net, 2024).

Quezon City is a landlocked highly urbanized city in the National Capital Region. It has a land area of 171.71 square kilometers or 66.30 square miles. Its population as determined by the 2020 Census was 2,960,048. This represented 21.95% of the total population of the National Capital Region. Based on these figures, the population density is computed at 17,239 inhabitants per square kilometer or 44,646 inhabitants per square mile.

Quezon City has a wide array of private schools, including well-known institutions like Ateneo de Manila University, Miriam College, and Xavier School. Other notable schools include Philippine Science High School System, Paref Rosehill School, and Multiple Intelligence International School. Additionally, there are numerous smaller private schools and learning centers throughout the city.

Among the major universities and high schools are: Ateneo de Manila University, Miriam College, Xavier School, Philippine Science High School System, Paref Rosehill School. Other notable private schools such as Multiple Intelligence International School: An institution that emphasizes multiple intelligences and personalized learning; International Christian School of QC: A school that provides a Christian-based education with an international perspective; Holy Child Academy: this is a private Catholic school that offers education from preschool through high school; Britesparks International School, Inc.; Benedictine International School of Q.C.; Blue Ridge Christian Academy.

Fires in schools are not uncommon, and inspections often reveal that many institutions fail to meet basic fire prevention standards. To minimize such incidents, schools must adopt preventive measures that safeguard both lives and property. Fire safety in schools largely depends on preparing students and educators, as emphasized by Ventura (2021), and requires the active involvement of the Fire Department in fostering a culture of fire prevention and protection within educational settings. Building fires remain among the most widespread hazards worldwide, causing significant injuries and fatalities each year. Reports from the US Fire Administration indicate that from 2008 to 2017, an estimated 1.3 million fire cases occurred annually, resulting in 3,400 deaths and 15,000 injuries. Fires can affect residential, commercial, and school buildings alike, with children and students being among the most vulnerable groups; in fact, around 100 million children globally are affected by disasters annually. When schools are disrupted by such incidents, students' physical and mental health, academic progress, and social development are placed at risk, potentially leading to long-term educational setbacks. Burn injuries rank as the third leading cause of child deaths, following car accidents and drowning. Historical incidents, such as the 1997 Shinabad school fire in Iran—which claimed the lives of two students and severely injured 28 others—underscore the dangers of unstandardized heating systems like oil heaters. These tragedies highlight the urgent need to address policy gaps in fire safety and preparedness to protect students and teachers, particularly in regions where schools often lack safe heating systems and adequate infrastructure.

Preventive strategies for schools include the proper storage of flammable materials, regular inspections of electrical systems, and the maintenance of clutter-free environments to reduce hazards. Strict no-smoking policies, the use of fire-resistant materials in construction and furnishings, and the installation of functional smoke detectors, alarms, and sprinkler systems are equally critical. Fire extinguishers should be accessible, well-maintained, and complemented by staff training on their proper use, including guidance on assisting students with special needs during emergencies. Regular fire drills, clear evacuation plans, and well-marked, unobstructed exit routes are necessary to ensure efficient evacuation. During drills or real incidents, students and staff should be reminded of safe practices such as staying low to the ground to avoid smoke inhalation and refraining from re-entering buildings until declared safe.

Given the frequency of school fire incidents, this study was undertaken to examine the fire safety practices implemented in selected private schools in Quezon City. The researcher, currently assigned at the Central Sub-station of the Quezon City Fire District, sought to assess how these institutions address fire safety in order to identify strengths, gaps, and opportunities for improvement.

Effective fire safety education plays a vital role in ensuring public safety, and social media platforms provide important channels for disseminating this information. As mandated by Presidential Decree No. 1185, later repealed by RA 9514 in Section 2 of the Fire Code of the Philippines, this "Decree and the Rules and Regulations for its implementation shall be known as the 'Fire Code of the Philippines'." The declaration of policies emphasizes that the government, in cooperation with the private sector, shall develop and promulgate standards and regulations based on the latest developments in fire technology suited to Philippine conditions; that fire prevention and safety should be given equal or greater importance than fire suppression, with continuous fire prevention education involving all community sectors; that the Fire Service of the Integrated National Police must aim to respond to all fires before reaching critical stages, supported by improved organization, personnel, equipment, and effective alarm systems; and that the Fire Service must be professionalized, with educational institutions incorporating courses on fire technology and fire protection engineering. In addition, Section 8 highlights the need for inspection, safety measures, and protective systems, requiring owners, administrators, or occupants of buildings and facilities to comply with rules concerning the use or occupancy of structures, installation of fire safety equipment and electrical systems, and the proper storage, handling, and use of hazardous materials. Further support is found in Department Order No. 28 s. 2016, or the Guidelines on Strengthening the Fire Safety and Awareness Program (FSAP), which outlines the roles and responsibilities of the Department of Education in monitoring and evaluating program compliance with the Fire Code. This order also reinforces the partnership with the Department of Interior and Local Government (DILG), through the Bureau of Fire Protection (BFP), to ensure the implementation of a sustainable fire safety program for schools.

2. Literature review

In 1977, Presidential Decree 1185 established the Fire Code of the Philippines, which set standards and prescribed practices to prevent both accidental and intentional fires, with its primary objective being fire prevention aimed at reducing physical, occupational, and moral hazards that contribute to fire occurrence and spread. Fire safety is understood as a broad concept encompassing prevention, protection, and firefighting measures, with the oxidizer identified as the element that activates fire and intensifies combustion through its interaction with fuel gases or vapors (Fagundes, 2013, p. 22). As Ono (2013, apud Gomes, 2014) emphasized, these measures collectively work to maintain fire risks at a tolerable level, ensuring that both public and private activities protect individuals from threats to their physical integrity in the course of work or daily conditions (Rego, 2011). Within this context, the present study examines the importance and strategies of fire safety in schools, aiming to confirm or refute the hypotheses established. Schools must recognize the risks of fire by forming school brigades and implementing training programs in firefighting and first aid. Moreover, as argued by various authors, the issue of fire safety requires more serious discussion among technicians, professionals, policymakers, and citizens, extending beyond legislation to include systematic mapping of strategies that provide a comprehensive view of how fire safety is addressed at the municipal level in Brazil. These efforts are necessary to ensure rationalization, organization, and prevention in fire management, making it possible to avoid catastrophic consequences within schools.

The relevance of this work lies in its call for concrete actions such as fire response, evacuation, and the cultivation of a safety culture within schools through structured programs and planning. Such initiatives can help administrators, teachers, and students anticipate risks, improve decision-making, and reduce losses or tragedies. Research highlights the importance of meeting basic safety requirements, including the adequate number and proper placement of fire extinguishers, timely replacement of expired units, emergency signage, and lighting. Guaspari et al. (2012) noted that fire safety in buildings has become increasingly critical, particularly during emergencies like fires, earthquakes, and terrorist attacks, where occupant behavior is a key determinant of survival (Kobes et al., 2010). Globally, fire-related threats to life and property are significant, with more than 300,000 annual fire-related deaths reported worldwide

(Jonsson et al., 2017). In China, Xin and Huang (2013) reported that residential buildings account for 39.7% of all fires, causing an estimated USD 48,936,330 in property damage, 347 civilian injuries, and 853 deaths annually. Addressing such threats requires solutions such as fire hazard education, building regulations, interventions, and fire prevention programs. As FEMA (2017) stressed, fire safety management in buildings involves both passive and active measures designed to reduce risks to life, property, and the environment, thereby maintaining fire risks at an acceptable level.

In his effort to review various literature on fire safety Adeyemi A. (2015) wrote, managing school fires means taking action in three areas. The first is emergency planning. The second is education for staff, students, and families about what actions to take in case of fire. The third step is ensuring the school building is kept firesafe. Through education, disaster management concepts can be cultivated in students, enabling them to establish proper perception of incident. Therefore, their incident response capability societies such as families can be improved. Schools and students need to build resilience to emergencies and be prepared to reduce their consequences, both to ensure that effectiveness response and also that the education continues as quickly and efficiently.

A recent systematic review of human behavior under building emergencies (Lin et al., 2020 shows that emergency evacuation was the primary behavior and have been researched extensively since the 1950s and especially after the world trade center (WTC attack in 2001 (Gershon et al., 2012. Hassan (1999) concluded that the safety of occupants in building should be the main concern for all professionals' bodies involved in both design and construction of buildings. Nevertheless, the design and safety in buildings will not be enough if adequate preparation is not put in place by the occupant and users of constructed facilities.

According to Abdel Gawad and Abdullahi (2019), emergency evacuation refers to the movement of people from a hazardous area to a safe destination, with its time-dependent features often evaluated in research (Kobes et al., 2010). Adolescent evacuation behavior is commonly studied in two phases: the pre-evacuation period and the movement period. The latter has been the focus of most studies, emphasizing the primary goal of occupants in emergencies, which is to reach safety in the shortest possible time, with wayfinding being the key human behavior involved (Viler et al., 2014). The pre-evacuation time, defined as the interval between the start of a fire and the moment an individual decides to evacuate, is often described as a delay period that may last from seconds to hours and can greatly influence overall evacuation efficiency (Proulx, 2021; Lin et al., 2020; Kobes et al., 2010).

In the school setting, fire safety refers to precautions aimed at preventing or reducing the likelihood of fires that can lead to injuries, deaths, or property damage. These measures must be integrated from the construction stage of a school. Assessments indicate that non-teaching areas such as kitchens, offices, storage rooms, prep rooms, and electrical switch rooms present the highest fire risks. Because of these hazards, schools are required to follow strict safety rules, with fire safety among the most essential. Fire protection equipment, drills, and emergency procedures must be in place so that students, teachers, and staff can respond calmly and effectively during an outbreak. Even when schools are equipped with sprinkler systems, alarms, and other fire detection devices, regular fire drills and safety education programs remain critical to ensure readiness among all building occupants.

Certain areas within schools demand particular precautions, including the proper maintenance of storage rooms, disposal of waste, and control of flammable materials. Best practices include maintaining functional fire exits and exit signage that remain operable during power failures, placing and regularly servicing fire extinguishers, safely storing hazardous materials, prohibiting flammable substances in restricted areas, and maintaining reliable fire alarm systems. Schools must also keep updated inventories of fire safety equipment, sustain high levels of fire safety awareness and training among staff and students, and conduct regular fire drills throughout the school year. Research shows that the most common fire hazards in schools stem from arson, overloaded electrical systems, fuel storage with insufficient protection, and the presence of materials that emit toxic fumes when heated. Other risks include blocked fire exits, faulty electrical wiring, misuse of appliances, and unattended open flames such as candles.

School fires have multiple causes, the most common of which is arson, accounting for about 60% of incidents, often occurring during holidays when no one is present to detect or respond. Automated sprinkler systems are critical in mitigating the impact of such attacks. Unintentional fires are also frequent, as it is difficult to monitor all students, and risks arise from smoking, mishandling flammable chemicals, or improper activities inside and outside science laboratories. Poor maintenance further contributes to fire hazards, as neglected fire systems may fail, often due to cost-cutting measures, even though the potential losses from a fire far exceed maintenance costs. Faulty electrics, such as poorly maintained wiring and equipment, are another leading cause, highlighting the importance of regular testing and repair. Certain school areas present inherently high risks, including science labs with burners and chemicals, design workshops with overheating equipment, and IT rooms with overloaded sockets. Additionally, when schools are rented

to community groups or for public events, fire safety procedures are not always observed, creating further vulnerabilities.

To address these risks, several fire safety precautions must be implemented. Fire doors, particularly in high-risk areas like laboratories and kitchens, are essential to delay the spread of fire and smoke, protect structural integrity, and allow safe evacuation. Active fire protection measures, including sprinklers, extinguishers, and smoke detectors, should be strategically installed, with sprinklers especially valuable for fires occurring outside school hours. Equally important is comprehensive staff training, equipping personnel with knowledge to prevent fires and respond effectively during emergencies. Training also strengthens the school's overall safety culture, enabling staff to identify hazards promptly. As noted by the International Journal of Engineering Research & Technology (IJERT), optimal fire protection requires an integration of prevention, protection, and suppression, with each element involving physical, management, and human controls. Fire prevention aims to stop fires from occurring, suppression focuses on extinguishment, and protection combines both at the design and operational stages.

According to Suraj, Darshan, Kadam, et al. (2022), fire safety refers to the set of procedures that control the spread and impact of fires, whether intentional or accidental, while minimizing damage. Building codes of practice, though prescriptive, generally follow similar principles that combine active systems—such as sprinklers, heat and smoke detectors—and passive measures like structural fire resistance, both of which complement each other in safeguarding life and property. From a life safety perspective, active systems are particularly critical since they detect and suppress fires early, while passive systems ensure structural stability and containment, providing time for evacuation and firefighting. Kodur and Rafi (2019) emphasized that schools hold a vital role in society beyond their educational mission, as they influence communities through teachers, parents, and children. Renovating school facilities in collaboration with local governments, NGOs, and communities not only improves structural safety against hazards like earthquakes but also promotes a culture of disaster prevention and preparedness, enabling schools to serve as safe shelters during crises. Shaw and Kobayashi (2021) further noted that schools, classified as "Essential Structures" similar to hospitals, are critical for emergency response and recovery. However, the frequent repurposing of school facilities as evacuation centers compromises their role in ensuring learning continuity, underscoring the need to strengthen school infrastructure and management to balance safety and educational functions.

School buildings exhibit diverse designs shaped by culture, era, climate, and regulatory changes, often funded through LGUs, private donors, ODA initiatives, and the Department of Education. This diversity has resulted in a wide range of architectural forms, color schemes, and materials. As noted in *Emerald Insights*, buildings constitute much of the world's infrastructure and play a vital role in socioeconomic development, often lasting decades and serving large populations. However, throughout their lifespan, they remain vulnerable to both man-made hazards such as fire and explosions, and natural hazards like earthquakes, hurricanes, and tsunamis. Such events can cause partial or total collapse, threatening lives and leading to massive financial losses. To safeguard lives and maintain structural integrity, buildings must be designed to withstand predicted risks, with fire being one of the most extreme hazards.

In educational environments, strict adherence to safety rules is paramount. Schools must prioritize fire safety through proper equipment, regular fire drills, and training of staff, teachers, and students to ensure calm and efficient responses in emergencies. Fire safety practices not only reduce the risk of accidents but also prevent misuse of fire by students. Despite the evidence supporting these practices, comprehensive, evidence-based frameworks remain lacking. Effective fire safety strategies should be grounded in change theory, aligned with the curriculum, delivered by educators, and reinforced by firefighters. While some schools are equipped with advanced fire suppression systems such as sprinklers, regular fire drills and awareness programs are still essential to guarantee readiness.

Republic Act 9514, or the Fire Code of the Philippines, mandates that building owners, administrators, and occupants incorporate fire safety construction features, protective and warning systems, and programs. These provisions include sprinklers, hose reels, fire alarm systems, fire walls, fire-resistive floors, smoke-sealed stairways, well-marked exits, self-closing fire doors, fire dampers, roof vents, and illuminated exit signage, all designed to confine fires, ensure safe evacuation, and aid firefighting efforts. As Pennerbit Press (2022) explains, schools are multifunctional facilities intended to provide varied learning spaces, from classrooms and libraries to laboratories and art rooms, accommodating large groups daily (Masy, 2015; Ariani & Mirdad, 2016; Lopez-Chao et al., 2017; Neufert & Neufert, 2022). Their design must therefore support education while integrating safety requirements.

Past fire disasters in the Philippines highlight the deadly consequences of non-compliance with the Fire Code. The NCCC Mall fire in Davao City on December 23, 2017 killed 38 people due to an electrical short circuit (Antonio IV, 2018; Basa, 2017; Colina, 2018; Revita, 2017; Nawal & Lim, 2017; Villamor, 2017a; 2017b). Similarly, the Kentex Manufacturing factory fire in Valenzuela City in 2015 killed 74 people, while the Ozone Disco fire of 1996 remains the deadliest, with

162 deaths (Bautista, 2017; Mayuga, 2018). These tragedies, coupled with data showing that fire ranked as the sixth leading cause of unintentional injury-related deaths across all ages in 2017 (National Safety Council, 2020), underscore the importance of fire code compliance. The National Safety Council (2018) and William Hird & Company (2020) further note that families sleeping in fire code-compliant homes with functional smoke alarms have a survival probability greater than 50% during nighttime fires.

Ferrer (2021) emphasized that fire prevention programs and education are crucial for community safety, as daily tasks often involve hazardous conditions. Inspectors play a key role by ensuring compliance with safety measures, while community fire protection programs offer valuable education to children, parents, and residents, building knowledge in risk management and prevention. Although implementation varies across locations, the Bureau of Fire Protection's unified prevention programs remain essential. As existing studies show, adherence to the Fire Code of the Philippines is a fundamental step in preventing fire incidents and protecting lives and property.

Recent research increasingly agrees on the effectiveness of social media platforms as educational tools, particularly in promoting fire safety. Kaplan and Haenlein (2010) highlight that social media is well-suited for disseminating safety information because of its interactive features and wide reach. Platforms such as Facebook, Instagram, and Twitter allow fire safety awareness to be spread through videos, infographics, and quizzes (Cruz & Torres, 2015; Naderi & Zadeh, 2018). These tools not only raise awareness but also teach diverse audiences essential fire safety practices and emergency responses. Studies emphasize the importance of tailoring content to cultural contexts and demographic groups (Dizon & Kang, 2019; Seo & Kang, 2020) while leveraging social media's real-time interaction for feedback and engagement (Brown & Basheer, 2017; Yoo & Lee, 2021). Yoo and Lee (2021) found that Instagram campaigns using user-generated content fostered peer-to-peer learning, while Park and Kim (2019) demonstrated the value of virtual reality simulations in improving fire safety understanding. Despite these benefits, challenges remain, such as ensuring accuracy of shared information, addressing language barriers, and promoting digital literacy across varying user groups. Nonetheless, social media presents opportunities to transform fire safety education by delivering creative, interactive, and engaging content.

Within schools, the need for effective fire safety is critical since children and young people are prone to panic and may be difficult to manage in emergencies. Fires disrupt learning environments and cause psychological harm to students, teachers, and families (Hassanain, 2016). Njoroge (2018) explored the link between school inspections and disaster preparedness, finding that safety generally improved after inspections, though the number of inspector comments or scores did not directly affect outcomes. Smith (2018) noted that students who received Bureau of Fire Protection (BFP)-based education demonstrated higher fire safety knowledge, underscoring the importance of integrating BFP practices into curricula. However, Smith and Garcia (2019) identified resource limitations and compliance barriers, stressing the need for government and institutional support. Locally, Santos and Lim (2019) found that BFP-led fire drills and courses empowered students and teachers, while Manaois-Ocampo (2019) reported that in Mangaldan public elementary schools, training and disaster management committees were in place but firefighting equipment such as hydrants, hoses, and detectors remained inadequate. The present study builds on Manaois-Ocampo's work but differs in its focus on private high schools in Quezon City rather than public elementary schools.

The study adopted the Input-Process-Output framework. Inputs included assessing the level of fire safety implementation, identifying challenges, and proposing measures to strengthen practices. The process involved distributing questionnaires, applying statistical analysis, constructing and interpreting data, and performing descriptive analysis. The output consisted of strategies aimed at improving fire safety practices in selected private schools in Quezon City. The purpose was to determine the level of implementation of fire safety practices, identify issues and challenges, and recommend improvements. Guided by the hypothesis that fire safety practices are not implemented in private schools in Quezon City, the study contributes insights relevant to several stakeholders. School administrators may use the findings to evaluate facilities and develop policies; teachers may be encouraged to reinforce fire safety practices in schools and communities; parents may apply findings at home; and the Bureau of Fire Protection may gain a clearer understanding of school-level fire safety measures. The study also supports the broader educational community in fostering awareness and prevention, offers the researcher a basis for training and advocacy, and provides future researchers with reference material.

The scope of the study was limited to identifying factors influencing fire safety practices in private schools in Quezon City and how these factors affect implementation. Standardized norm-referenced tests of content knowledge were applied as indicators. The study covered seven schools—Capitol Hills Christian School, Claret School of Quezon City, Holy Family School of Quezon City, School of Saint Anthony Quezon City, Quezon City Christian Academy, St. Patrick School of Quezon City, and Wisdom Light Christian Academy. Other private schools were excluded, and the role of the

Bureau of Fire Protection was not directly studied since the focus was on school-based practices. The respondents were randomly selected teachers, and financial aspects of fire safety practices were outside the scope of the research.

3. Research design

3.1. Method of Research and Technique in Data Gathering

In this study, the descriptive survey method was employed. Regarding a particular issue, the descriptive research technique describes the kind of research question, design, and data analysis that were used. Inferential statistics attempt to discern cause and effect, whereas descriptive statistics describe what is. This study used a descriptive survey to conduct quantitative research. It places an emphasis on objective measures and the statistical, mathematical, or numerical analysis of data gathered via surveys, questionnaires, and polls, as well as the use of computing methods to modify statistical data that has already been acquired. Getting numerical data and extrapolating it to other populations or to explain a specific phenomenon—like the fire safety procedures of Quezon City's private schools—is the main goal of quantitative research.

3.2. Sources of Data

The primary source of data used in this study was survey questionnaire while the secondary data was taken from the books, magazines, journal articles, Republic Acts, including previous research studies, theses, and dissertations from previous libraries and online sources.

3.3. Respondents of the Study

The respondents of the study were taken from the teaching and non-teaching staff of seven (7) private schools in Quezon City to determine the fire safety practices implemented in the identified schools namely: Capitol Hills Christian School, Claret School of Quezon City, Holy Family School of Quezon City, School of Saint Anthony Quezon City, Quezon City Christian Academy, St Patrick School of Quezon City, and Wisdom Light Christian Academy. A sample of 197 respondents were randomly selected from a population of 392 personnel covering 50% plus 1 majority count.

3.4. Procedure of the Study

To accomplish the data needed for this research, the following was considered: first, the researcher gathered the list of fire safety practices from different sources as basis for the construction of the research instrument, administration of the instrument was also discussed.

3.4.1. Construction and Validation of the Research Instrument

A research tool derived from a variety of studies and literature sources is the survey questionnaire. The objects were selected from a variety of relevant literary sources as well as firsthand on-site observations. The fire safety procedures used by Quezon City's private schools were covered in Part I. Indicators related to the Disaster Management Committee were included in Part II. There were signs on the firefighting equipment in Part III. The suggested suggestions to improve the application of fire safety procedures in private schools were included in Part IV.

Using the descriptive ratings of Fully Implemented (4), Partly Implemented (3), Barely Implemented (2), and Not Implemented (1), a 4-point scale was employed to gauge the degree of implementation. Since the research tool was taken from Manaois's (2019) study, it had already been validated in the earlier study.

3.4.2. Administration of the Research Instrument

The letter of request to conduct the study was prepared by the researcher for the different school principals of the private schools and signed by the Researcher's Adviser. After permission was secured, the instrument was administered to the respondents coming from the seven (7) private schools involved in the study. After the instrument was answered by the respondents, it was retrieved on the same day as the respondents were readily available. Data was tabulated, analyzed, and interpreted.

3.5. Method of Data Analysis and Interpretation

The data collected was organized and classified according to the problems formulated. The data was coded, tallied and tabulated to facilitate the presentation and interpretation of the results using frequency and weighted mean. To answer problem statement number 1, the researcher utilized weighted mean as the statistical tool.

For Problem Statement 2, the data were analyzed using frequency counts and percentages to describe how often each response category occurred. The results were interpreted using a four-point scale. Scores with weighted means from 3.25 to 4.00 were classified as **Fully Implemented**, those from 2.50 to 3.24 as **Partly Implemented**, 1.75 to 2.49 as **Barely Implemented**, and 1.00 to 1.74 as **Not Implemented**. This interpretive scheme provided a clear basis for describing the extent to which each fire safety indicator was put into practice.

4. Results and discussion

4.1. Level of Implementation of Fire Safety Practices by Private Schools in Quezon City

Table I exhibits the observation and perception of the respondents on the level of implementation of fire safety practices in the private schools of Quezon City. The table shows 18 list of indicators that revealed an average weighted mean of 3.62 described as Fully Implemented.

The first indicator that received a weighted mean of 3.94 and described as Fully Implemented is on *doors and windows of classrooms and other school buildings are easy to open as required.*

Table 1 Level of implementation of fire safety practices in selected private schools of quezon city n = 197

Indicator	Weighted Mean	Descriptive Rating
Doors and windows of classrooms and other school buildings are easy to open as required.	3.94	Fully Implemented
Necessary actions are taken to repair or replace defective wirings, light bulbs, etc.	3.86	Fully Implemented
There is a formulated Fire Escape Plan.	3.76	Fully Implemented
Suitable receptables such as litter bins, recycling bins, etc. are provided.	3.76	Fully Implemented
Fire drills are regularly conducted.	3.76	Fully Implemented
Shrubs and trees in the school vicinity are regularly trimmed	3.66	Fully Implemented
Regular electrical safety inspection is conducted.	3.66	Fully Implemented
Combustible waste such as papers, wood, plastics, paint tin, flammable liquids are not stored in heaps or loose in the open.	3.66	Fully Implemented
The school grounds are cleared from any waste.	3.65	Fully Implemented
Fire safety and control measures are formulated for contractors as they can increase the risk of fire and cause obstruction to escape routes.	3.64	Fully Implemented
Proper waste management is strictly enforced.	3.63	Fully Implemented
Unplug electrical wirings and turn off lights.	3.61	Fully Implemented
Exit/escape paths are free of obstruction.	3.47	Fully Implemented
There is a designated school personnel in-charge of the fire safety program.	3.46	Fully Implemented
Ensure the provision of fire safety and protection equipment, which should not be limited to fire extinguishers	3.46	Fully Implemented
Fire escape routes and exit paths are clearly marked with readable signages.	3.36	Fully Implemented
The school ensures the presence of Fire Escape routes and Exit Paths which the students and personnel are aware of	3.36	Fully Implemented
Laboratories are inspected daily	3.33	Fully Implemented
AVERAGE WEIGHTED MEAN	3.62	Fully Implemented

Legend: 3.25 – 4.00 Fully Implemented; 2.50 – 3.24 Partly Implemented; 1.75 – 2.49 Barely Implemented; 1.00 – 1.74 Not Implemented

Republic Act No. 9514 states that doors, particularly in gathering places like schools and centers, should push outward to make them easy to open. This means that people can quickly leave the fire area in the event of a fire. If the door cannot be opened, windows serve as an alternate means of escape.

The next Fully Implemented indicator, as reported by the respondents with a weighted mean of 3.86, is the *replacement or repair of damaged lightbulbs, wiring, etc.* This indicator is fully implemented because it is necessary to fix damaged wiring, particularly that which has been bitten off, exposing the copper. This is because water can cause fire if it gets into the exposed copper wire. Similarly, light bulbs, especially those that blink, can cause sparks, which can lead to fire.

Three (3) indicators received the same weighted mean scores of 3.76 all described as Fully Implemented, to wit: *there is a formulated fire escape plan; suitable receptacles such as litter bins, recycling bins, etc. are provided; and fire drills are regularly conducted.* To ensure the safety and readiness of the school environment and the wellbeing of both students and staff, a well-thought-out fire escape plan is necessary. Appropriate containers are essential for maintaining a safe workplace, preventing fires, and guaranteeing clear escape pathways in the event of a fire. Additionally, frequent fire drills are crucial for maintaining safety readiness since they teach staff and kids evacuation protocols, which lessens anxiety in the event of a real emergency. Students learn about emergency response and fire safety through fire drills as well.

Relatively, three (3) indicators generated the same weighted mean of 3.66 and a descriptive rating of Fully Implemented. The indicators are, as follows: *shrubs and trees in the school vicinity are regularly trimmed; regular electrical safety inspection is conducted;* and *combustible waste such as papers, wood, plastics, paint tin, flammable liquids are not stored in heaps or loose in the open*. Trees and shrubs should be regularly trimmed to lower the chance of igniting and readily stop the spread of fire in the event that one breaks out. The risk of electrical faults that could start a fire is decreased by regular electrical safety inspections, which are especially important for faulty wiring, overloaded circuits, and malfunctioning electrical components that can cause electrical fires. Additionally, it is crucial for fire safety to make sure that flammable waste, such as papers, wood, plastics, paint tins, and flammable liquids, are not stored in heaps or loose in the open because these materials can easily ignite and spread fire quickly, especially when improperly stored.

The school grounds are cleared from any waste displayed a weighted mean of 3.65 having a descriptive rating of Fully Implemented. For fire safety, it is essential to keep school property free of trash, particularly when it contains flammable items like papers, leaves, and plastics. Regularly removing trash from school property lowers the risk of fire and guarantees safe and convenient escape routes because this can act as fuel for flames, increasing their likelihood of starting and spreading quickly.

This was followed by the indicators on *fire safety and control measures are formulated for contractors as they can increase the risk of fire and cause obstruction to escape routes* generated a weighted mean of 3.64 or Fully Implemented. Because contractors' operations can increase fire risks and obstruct escape routes, it is crucial to develop fire safety and control measures specifically for them. They frequently use materials and equipment that could cause a fire, such as power tools, welding equipment, and flammable materials. The likelihood of fire incidents can be considerably decreased by putting in place stringent fire safety procedures, such as making sure that combustible items are handled and stored properly, performing fire risk assessments prior to beginning work, and keeping clear escape routes.

Proper waste management is strictly enforced received a weighted mean of 3.63 and described as Fully Implemented. Effective waste management is essential for fire safety because it keeps flammable items from building up and spreading fires. The risk of fire is reduced by maintaining clean waste storage facilities and making sure trash containers are properly sealed and placed away from heat sources. *Unplug electrical wirings and turn off lights* generated a weighted mean of 3.61 having a descriptive rating of Fully Implemented. Important fire safety precautions include unplugging electrical equipment and turning off lights while not in use. By lowering the likelihood of overeating, short circuits, and electrical faults that can start fires, these steps help lower the danger of electrical fires. Next *exit/escape paths are free of obstruction* has a weighted mean of 3.47 or Fully Implemented, In any setting, including schools, maintaining clear escape routes and exits is essential to guaranteeing efficient fire safety protocols. During emergencies, quick evacuation is made possible by clear and unobstructed pathways, which reduce the possibility of delays or accidents impeding evacuation attempts.

Two (2) indicators generated the same weighted mean of 3.46 and described as Fully Implemented. The following indicators are: *there is a designated school personnel in-charge of the fire safety program* and *ensure the provision of fire safety and protection equipment, which should not be limited to fire extinguishers*. Maintaining a high level of fire safety requires having a dedicated school employee oversee the fire safety program. This person makes sure that fire safety procedures are created, followed, and evaluated on a regular basis. They are in charge of maintaining fire safety

equipment, planning fire drills, conducting fire risk assessments, and training employees and students. The school can guarantee adherence to fire safety regulations, promptly address possible hazards, and cultivate a culture of safety awareness by assigning a dedicated individual to oversee these efforts. Comprehensive fire safety and protection equipment, which goes beyond fire extinguishers, is essential for efficient fire prevention and response. Fire blankets, sprinkler systems, smoke detectors, emergency lighting, and fire alarms should all be part of this equipment. Early fire detection using smoke detectors and fire alarms enables prompt evacuation and response. Fires can be automatically contained and put out with the use of sprinkler systems. Smothering minor fires or providing personal protection during an escape are two use for fire blankets. Safe evacuation is made possible by emergency illumination, which makes sure that escape routes are visible even during power outages.

Further, two (2) indicators also generated the same weighted mean of 3.36 described as Fully Implemented, as follows: *fire escape routes and exit paths are clearly marked with readable signages* and *the school ensures the presence of Fire Escape routes and exit paths which the students and personnel are aware of*. Important elements of school fire safety include well posted exits and fire escape routes, as well as making sure staff and pupils are aware of them. Signage that is readable and illuminated reduces confusion and fear by directing people to safe locations quickly and effectively in an emergency. Everyone is familiar with these routes and understands how to use them in the event of a fire thanks to frequent drills and training sessions. Maintaining unobstructed and uncluttered pathways consistently ensures that escape routes are always available. In addition to facilitating a quick evacuation, this readiness improves general safety by lowering the possibility of fatalities or serious injuries during a fire.

Finally, *laboratories are inspected daily* has a weighted mean of 3.33 with a descriptive rating of Fully Implemented. Because laboratories include potentially dangerous chemicals, combustible materials, and specialized equipment, daily inspections are crucial for fire safety. These examinations assist in locating and resolving any safety concerns, such as incorrect chemical storage, malfunctioning machinery, or clutter that can block escape routes. Frequent inspections guarantee that all safety procedures, including accurate chemical labeling, fire extinguisher availability, and operational fume hoods, are being observed. Daily inspections greatly lower the risk of fires and improve the general safety of students and employees working in these high-risk locations by upholding a high standard of safety and quickly eliminating any concerns.

4.2. Level of Implementation of the Disaster Management Committee in Selected Private Schools of Quezon City

Table II exhibits the level of implementation of fire safety practices of private high schools in Quezon City particularly on Disaster Management Committee according to the teaching and non-teaching personnel. The table shows an average weighted mean of 3.66 having a descriptive rating of **Fully Implemented.**

Table 2 level of implementation on the disaster management committtee in selected private schools of quezon city n = 197

Indicator	Weighted Mean	Descriptive Rating
The disaster management committee informs the school personnel on the school's disaster management plan.	3.82	Fully Implemented
The school has a disaster management committee.	3.68	Fully Implemented
The disaster management committee meets every year or twice in a year.	3.68	Fully Implemented
The school disaster management plan is updated annually.	3.63	Fully Implemented
The disaster management committee is activated in times of calamities such as flood, fire, and earthquakes.	3.60	Fully Implemented
The disaster management committee prepares and reviews the school disaster emergency plan.	3.53	Fully Implemented
AVERAGE WEIGHTED MEAN	3.66	Fully Implemented

Legend: 3.25 – 4.00 Fully Implemented; 2.50 – 3.24 Partly Implemented; 1.75 – 2.49 Barely Implemented; 1.00 – 1.74 Not Implemented

The first indicator is on *the disaster management committee informs the school personnel on the school's disaster management plan* generated a weighted mean of 3.82 described as Fully Implemented. A proactive attempt to inform

and prepare staff for catastrophes is demonstrated by the Disaster Management Committee's dissemination of the school's disaster management plan to the staff. By keeping everyone informed about their roles, duties, and protocols in times of crisis, this communication promotes a coordinated response to protect the safety and wellbeing of the school community.

The next two (2) indicators that received the same weighted mean of 3.68 and described as Fully Implemented. These indicators are: *the school has a disaster management committee* and *the disaster management committee meets every year or twice a year*. In times of crisis, this committee probably supervises the plans, procedures, and instruction to guarantee the security and welfare of the students, faculty, and school community. The disaster management committee meeting once a year or semi-annually demonstrates a commitment to reviewing and updating emergency preparedness plans on a regular basis, as well as a commitment to ensuring a coordinated response and effective management of various types of emergencies that could affect the school environment. It proposes a proactive strategy for guaranteeing preparedness for different kinds of crises, cultivating a safe and secure atmosphere within the school community by means of regular preparation and instruction.

The school disaster management plan is updated annually achieved a weighted mean of 3.63 or Fully Implemented while *the disaster management committee is activated in times of calamities such as flood, fire, and earthquake* generated a weighted mean score of 3.60 having a descriptive rating of Fully Implemented. This shows a systematic approach to protecting the school community, ensuring quick mobilization of resources, and putting established protocols into place to reduce risks and guarantee safety during emergencies. It also guarantees that protocols, resources, and response procedures are routinely reviewed and modified to address changing risks and challenges, improving the school's preparedness and ability to protect the well-being of its students, staff, and community.

Finally, *the disaster management committee prepares and reviews the school disaster emergency plan* received a weighted mean of 3.53 described as Fully Implemented. In an attempt to educate and prepare staff for catastrophes, the disaster management committee took the initiative to notify the school staff about the disaster management plan. By ensuring that everyone on staff is aware of their duties, responsibilities, and crisis response protocols, this communication promotes a coordinated response to protect the safety and wellbeing of the school community.

4.3. Issues and Challenges that Affect the Implementation of Fire Safety Practices in Private Schools of Quezon City

Table III manifests the indicators related to the issues and challenges that affect the implementation of fire safety practices of private schools in Quezon City. There are nine (9) indicators that hinder the implementation of the fire safety practices in schools.

Table 3 Issues and challenges that affect the implementation of fire safety practices of private schools in quezon city under equipment n = 197

Indicator	Frequency	Percentage
The school has no fire blankets.	145	73.60
The school has no fire sand buckets.	136	69.04
The school has no sprinkler system.	120	60.91
The school has no heat/smoke detectors.	87	44.16
The school has no fire hose and nozzles.	86	43.65
The school has no fire escape ladder.	43	21.83
The school has no fire hydrants.	42	21.32
The school has no fire alarm.	37	18.78
The school has no fire extinguishers.	12	6.09

145 respondents, or 73.60%, said that their schools do not have fire blankets, which would improve staff and student safety. With students, instructors, and staff, schools are crowded places. In the event of a fire, a nearby fire hydrant guarantees that firefighters can swiftly access a water supply to save lives. However, according to 136 respondents, or 69.04%, their schools do not have fire sand buckets. For small fires, particularly those involving electrical components

or flammable substances, these fire sand buckets in schools offer a quick, adaptable, and secure solution. They are inexpensive, user-friendly, eco-friendly, and a useful supplement to all-encompassing fire safety protocols.

Sprinkler system was disclosed by 120 or 60.91% of the respondents are being unavailable in their schools. Sprinkler systems are an important investment in the safety and well-being of the school community because they are necessary for early fire suppression, life safety, comprehensive fire protection, continuous operation, regulatory compliance, decreased fire damage, improved fire safety plans, peace of mind, and possible insurance benefits. In many respondents schools, their buildings do not extend beyond 2-storey which is a requirement for the installation of sprinkler system as mandated by the Fire Code of the Philippines.

Less than half of the respondents (87 or 44.16%) said that their schools do not have heat/smoke detectors. Early fire detection: Heat and smoke detectors are able to identify fires in their early phases. Heat detectors react to a sudden rise in temperature, whereas smoke detectors detect smoke particles in the air. Early notice lowers the chance of the fire spreading by enabling quick action. According to 86 responses, or 43.65%, their schools do not have fire hoses or nozzles. These tools offer a strong and straightforward way to put out big fires. Their ability to supply a large amount of water at high pressure is essential for efficiently managing and extinguishing fires.

According to 43 respondents, or 21.83%, there is no fire escape ladder at their school. In the event of a fire, these ladders offer a dependable and secure way for staff, instructors, and students to leave upper floors, particularly in situations where stairwells are blocked by smoke or flames. Subsequently, 42 respondents, or 21.32%, stated that their schools do not have fire hydrants. Students and employees are safer thanks to the fire hydrants. Given how many instructors, staff, and kids attend schools, having a fire hydrant close by guarantees that firefighters can swiftly obtain a water supply to save lives in the event of a fire.

Additionally, 37 respondents, or 18.78%, said that there is no fire alarm on their campus. For early fire detection, life safety, quick emergency response, orderly evacuations, property protection, adherence to safety rules, and school community peace of mind, fire alarms are essential in schools. Lastly, 12 out of the 197 respondents, or 6.09%, said that they could not see any fire extinguishers on the school grounds. In order to guarantee prompt response to fire crises, safeguard people and property, adhere to safety requirements, improve emergency readiness, and offer important fire safety teaching, schools must have fire extinguishers.

4.4. Proposed Strategies of Respondents in Enhancing the Implementation of Fire Safety Practices in their Schools

Table IV exhibits the proposed strategies to be employed by the private schools in Quezon City to enhance the implementation of fire safety practices.

The table shows 12 indicators that describe the building structures of the different private schools in Quezon City that are involved in this study. With 130 or 65.98% of the respondents, the first indicator—that *all fire exits should always be free of obstructions*—was the most popular choice. This facilitates a quick and secure evacuation in the event of an emergency. This preventative action lessens the possibility of delays or accidents that might happen if exits were blocked. It shows a dedication to preserving a safe atmosphere where safety procedures are regularly followed to safeguard all members of the school community.

Table 4 Proposed strategies by respondents in enhancing the implementation of fire safety practices in their schools n = 197

Indicator	Frequency	Percentage
Fire exits should be clear of obstruction at all times.	130	65.98
Each classroom should have two doors for entry and exit.	127	64.47
All laboratory chemicals should be properly stored.	112	56.85
All rooms must be well-ventilated to prevent the build-up of heat.	110	55.84
Classrooms must not be congested.	103	52.28
Doors in the school buildings should open outwards.	103	52.28
The fire assembly points must be well-labelled.	100	50.76

All exit routes should be well-labelled.	100	50.76
School physical structure must be checked regularly.	99	50.25
Laboratories (HELE, Science, Computer) must have two (2) doors.	97	49.24
Emergency exit routes should be posted in conspicuous places in buildings for everyone to see.	87	44.16
All windows in the school buildings must have no grills.	80	40.61

Two (2) doors for entry and exit should be included in every classroom, according to 127 respondents, or 64.47% of the sample. Each classroom has two (2) doors for access and leave, which improves convenience and safety. It offers other ways to avoid traffic and enables a more effective evacuation during emergencies. 112 or 56.85% of the respondents suggested that all laboratory chemicals be stored appropriately. A safe learning environment is ensured by properly maintained laboratory chemicals, which reduce the possibility of contamination, spills, and accidents. This procedure shows compliance with safety guidelines and standards, shielding employees and students from possible risks while preserving the chemicals' integrity and suitability for teaching.

The next indicator proposed by 110 respondents, or 55.84%, is that all rooms should have adequate ventilation to avoid heat accumulation. Heat accumulation is avoided in well-ventilated spaces, making them more cozy and favorable for learning. In addition to lowering the risk of health problems linked to inadequate air circulation, proper ventilation helps preserve acceptable air quality and guarantees that employees and students can remain attentive and productive. 103, or 52.28%, of the respondents rated that classrooms should not be crowded and that doors in school buildings should open outward. In most school buildings, doors that open outward are made with safety in mind. During crises, such fires, this architecture makes evacuation simpler and faster. by permitting individuals to force the doors open without worrying about crowds or impediments. Congested classrooms offer a more pleasant and productive learning environment, and it demonstrates a focus on safety procedures and effective building design to guarantee the wellbeing of students and staff.

One hundred, or 50.76%, of the responders suggested that all exit routes and fire assembly points be properly labeled. Assembly points with clear labels improve school safety and emergency readiness. During a fire or other emergency, staff and students can quickly and easily locate designated safe places thanks to clear signage, which makes it easier to maintain order during evacuations and effectively keep track of everyone. Furthermore, by offering distinct, easily identifiable routes for evacuation in the event of an emergency, well-marked escape routes in school buildings improve safety. This lessens the possibility of confusion or injury by ensuring that visitors, employees, and students can all exit the building swiftly and effectively.

99, or 50.25%, of the respondents recommended that the *school physical structure be inspected on a regular basis*. Safety and structural integrity are guaranteed by routine inspections of the school's physical infrastructure. This procedure aids in quickly identifying and resolving possible risks, maintenance requirements, or structural problems. It demonstrates a proactive attitude to preserving a secure and useful environment for visitors, employees, and students alike. Therefore, according to 97 or 49.24% of the respondents, *laboratories (HELE, Science, and Computer) need to have two (2) doors* in order to improve the school's execution of fire safety procedures. Two-door laboratories improve both functionality and safety. The two entrance points enhance traffic flow and enable prompt evacuation in an emergency. Additionally, this design facilitates improved student monitoring and management, guaranteeing that the labs are secure, effective, and supportive of concentrated, experiential learning.

87, or 44.16%, of the respondents chose the next indicator, which states that *emergency exit routes are posted in. conspicuous places in buildings* so that everyone can see them. By ensuring that residents know the quickest and safest routes to leave in case of an emergency, this procedure improves safety and makes evacuations more effective and organized. Eighty, or 40.61%, of the respondents suggested that *all windows in school buildings must have no grills*. The lack of window grills in school buildings might represent an emphasis on openness, safety, and a friendly atmosphere. It shows that the space is deemed safe from outside threats that would require grills and conveys confidence in the school's security efforts.

5. Conclusions

This study was grounded on the hypothesis that fire safety practices are not implemented in selected private schools of Quezon City. The findings, however, revealed otherwise, as respondents indicated that fire safety practices, including

the establishment and operation of Disaster Management Committees, are fully implemented in their respective schools. In this regard, the hypothesis was not accepted. Nonetheless, the study also uncovered that firefighting facilities are not adequately provided or maintained, which confirms that the hypothesis is accepted in this aspect. These results suggest that while organizational structures and procedural measures for fire safety are being observed, there remains a critical gap in terms of physical resources and equipment necessary for effective firefighting and emergency response.

5.1. Recommendations

In light of these findings, the study recommends several measures to further strengthen fire safety management in private schools of Quezon City. Schools should continue to conduct, facilitate, and monitor regular fire safety drills and procedures throughout the year, including off-school seasons, to ensure preparedness. Administrators must designate a fire safety officer or program coordinator, with the Administrative Officer assuming responsibility in cases where no teacher is available, to oversee implementation and maintain coordination with the Bureau of Fire Protection. In schools housed in older buildings or those constructed with lighter materials, annual or semi-annual inspections of electrical systems should be arranged, with immediate replacement of exposed wiring or defective lightbulbs. Teachers and staff must also strictly enforce the disconnection of electrical devices and lights when not in use, which not only reduces fire risks but also minimizes energy consumption. Regular inspections of laboratories, such as science, computer, and Home Economics facilities, are also essential to identify and eliminate hazards like broken tiles or loose faucets that may endanger students. With regard to disaster preparedness, schools must maintain active and effective disaster management committees that prioritize student safety and update their disaster management strategies regularly to address emerging environmental challenges. Frequent orientations and drills should be carried out to ensure that both staff and students are fully aware of their roles and responsibilities in the event of emergencies. In terms of firefighting facilities, schools are encouraged to upgrade their equipment to ensure reliability and effectiveness. Improvised alarm systems, such as oxygen tanks repurposed as warning bells, should eventually be replaced with standard fire alarm systems, while a dependable water supply must also be secured to support emergency response. Finally, attention must also be given to the physical structures of school buildings. Classroom doors should be reoriented to open outward to prevent entrapment during emergencies. Laboratories must have at least two exits to facilitate quicker and safer evacuation, with additional emergency exits created if necessary. Grills on classroom windows should be removed to provide alternative escape routes, and in accordance with the Philippine Code of Sanitation, every classroom must be equipped with two doors for entry and exit. Altogether, these measures would significantly strengthen the fire safety practices of private schools and ensure the protection and well-being of their students and staff.

Compliance with ethical standards

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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