

REHABILITATION DURING CRISIS: INTEGRATING PHYSICAL THERAPY IN THE DISASTER RESPONSE EFFORTS IN BIÑAN

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ABSTRACT

The Philippines, known as a disaster-prone country, frequently experiences natural disasters. Disasters such as typhoons, floods, and earthquakes severely affect public health and security and strain disaster management. While physical therapists (PTs) play a crucial role in rehabilitation—they continue to be underutilized in disaster management. This study aims to explore the integration of physical therapy into disaster response frameworks within Biñan, Laguna, to address the rehabilitation needs of affected communities. A qualitative-developmental research design was employed using a focus group discussion (FGD) with physical therapists and key stakeholders from the City Disaster Risk Reduction and Management Office (CDRRMO). This study curated a model from existing disaster guidelines and works of literature to develop an integrated disaster response model. Data were analyzed thematically to identify key roles, barriers, and policy gaps affecting the inclusion of PTs in disaster settings. Findings reveal that physical therapists can significantly contribute across all phases of disaster management—emerging as an essential element in disaster response—including their role of early intervention, acute care, and long-term rehabilitation. However, undefined roles, policy gaps, and resource constraints hinder their effective deployment. The study presents a comprehensive framework to which institutionalizes PTs in local disaster response efforts. Integrating physical therapy into Biñan's disaster response enhances community resilience, improves recovery outcomes, and ensures inclusive care for vulnerable populations. This research advocates for policy reforms and capacity-building initiatives to formalize PT roles in disaster preparedness and emergency response in Biñan.

Keywords: Disaster Management, Physical Therapy Integration, Rehabilitation Frameworks, Policy Gaps, Community Resilience

INTRODUCTION

The Philippines is considered one of the world's natural hazard "hotspots" due to its location, and it suffers more natural hazards like floods and typhoons than any other country (Santos, 2021). These natural disasters impose strenuous physical, psychological, and economic hindrances on the affected residents. Floods and storms are the leading natural disasters, accounting for 44% and 28% of global catastrophes (UNDRR, 2020; Gray et al., 2022). The Philippine Area of Responsibility (PAR) faces an average of 20 typhoons yearly, 25% of the global occurrence, and 9 make landfall (Lapidez et al., 2015; Santos, 2021). The effects of these tragedies introduce challenges to the Philippines' healthcare system, especially in allocating immediate medical intervention.

The surrounding cities and municipalities of Laguna de Bay are the most vulnerable to flooding – varying from high to low danger—depending on the location (Cruz & Dapito, 2022). The singular effects of or mixed influence of extreme rainfalls, overflow of watersheds, and storm surges brought by strong winds may determine the flooding incidence (Rivera, 2013; Cruz & Dapito, 2022). On October 31, 2022, the local government unit (LGU) of Biñan, declared a state of calamity because of the effects of severe tropical storm "Paeng." The severe tropical storm displaced 1,359 families or 5,620 individuals in 16 evacuation centers (Deña, 2022). Floods last for as long as months in the lakeshore communities of Biñan (Cinco, 2020; Cruz & Dapito, 2022). With the risk of flooding, these communities may experience more disastrous storm surges by strong typhoon winds (Cruz & Dapito, 2022). Furthermore, in the past ten years—a total of 954 earthquakes with a magnitude four and above have hit within 300 km (186 mi) of Biñan (Earthquake List, 2024). On July 24, 2021—The most powerful earthquake of the past 10 years near Biñan occurred. It had a magnitude of 6.7 and struck 81 kilometers (50 mi) south-southwest of Biñan (Earthquake List, 2024).

Potutan and Masaru Arakida (2021) stated that if the disaster response system is inadequate, it could lead to more destructive impacts and substantial loss of lives. The Philippines performs poorly in disaster management, particularly in financial utilization, information management, leadership, monitoring, and coordination with various stakeholders (Commission on Audit [COA] Report 2014; Dariagan et al., 2021). The most vulnerable individuals among those who have experienced natural disasters are Persons with disabilities (PWDs) and the elderly. These groups of people are often excluded from disaster management (UNISDR, 2014; Rohwerder, 2015; Chua & Obra, 2022), and healthcare providers rarely recognize their unique needs (Guddo & Ramesh, 2020; Chua & Obra, 2022).

According to Gosling et al. (2023), health emergencies present an opportunity to assist the population affected by natural disasters by developing accessible rehabilitation services. The advancements made in recent years resulted in higher survivability of people with disabilities, such as musculoskeletal injury and traumatic brain injury. Smith J. et al. (2015), as cited by Khan and Bhasker (2021), stressed the significant benefits of early involvement in rehabilitation programs, such as minimizing mortality, reducing disability, and improving recovery of survivors, emphasizing the importance of well-timed intervention in disaster response and management. Khan and Bhasket (2021) stated that PRM, or Physical and Rehabilitation Medicine, must begin during emergency response and continue long-term until patients meet treatment goals.

Chua and Obra (2022) state that physical therapy in the Philippines is relatively unexplored and overlooked in disaster risk reduction and management (DRRM). The current strategy for disaster management prioritizes immediate medical intervention rather than involving rehabilitation efforts—underutilizing physical therapy. This underutilization expresses the unawareness and the ill-defined role of physical therapy in the community, possibly limiting the effectiveness of physical therapists (Trivedi & Rathod, 2018; Chua & Obra, 2022). The situation showcases the need for disaster response research and physical therapy integration. Klappa and colleagues (2013), as cited by Chua and Obra (2022), reasoned that physical therapists are valuable during disaster situations; they train to execute and provide various sorts of care, namely clinical care, patient education, and community outreach skills. The researchers intend to study and develop a

disaster response framework and integrate physical therapy in emergency response as it pushes for a multi-faceted approach to rehabilitation. Understanding these roles would guide the professional development of evidence-based practice in responding to a disaster. This study will shed light on improving disaster recovery through physical therapy interventions.

LITERATURE REVIEW

Underutilization of Physical Therapists

According to Amatya and Khan (2023), natural disasters have been recorded to occur 7,348 times worldwide between 2000 and 2019 (UNISDR, 2020; Amatya & Khan, 2023). One of the most disaster-prone regions is the Asia-Pacific, which has been responsible for 40% of the world's disasters over the decade as seismic fault lines surround the regions and contain landscapes that embody an increased risk for natural hazards to occur (UNISDR, 2020; Amatya & Khan, 2023). Moreover, Pacific Island Countries (PICs) are the world's top 30 most vulnerable to natural disasters (Amatya & Khan, 2016; Amatya & Khan, 2023). Disability from severe injuries and loss of life are the product of natural disasters. From 2000 to 2019, natural disasters were responsible for approximately 1.23 million deaths and caused 4 billion people to be affected by them (UNISDR, 2020; Amatya & Khan, 2023).

Saving lives immediately due to the advances in disaster response and management caused a significant increase in survivors—which also caused the number of survivors with disability (temporary or permanent) and complex impairments to increase (Amatya & Khan, 2017; Amatya & Khan, 2023). The most common type of injury caused by earthquakes was reported to be orthopedic—with lower extremity fractures being widespread (Bortolin et al., 2017; Amatya & Khan, 2023). Additionally, there is also an increase in the total amount of victims with aggravation of non-communicable diseases and psychological impairment (Ngaruiya et al., 2022; Amatya & Khan, 2023). These results indicate the significant part of medical rehabilitation in the extensive disaster management plan (Amatya & Khan, 2023).

Furthermore, despite the acknowledgment from the authorities of global healthcare that rehabilitation shares a vital part in solving the challenges involving overall disaster management systems, shortage of rehabilitation services, and lack of workforce—rehabilitation services are still frequently overlooked in preceding disasters—and most of the disaster-prone countries still have limited rehabilitation resources and low adaptability (Amatya & Khan, 2023).

According to Tan (2023), the increasing occurrence of natural hazard-driven sudden-onset disasters globally has led to significant challenges in healthcare response, particularly in providing rehabilitation services. These disasters result in a range of injuries, minor to severe, which may lead to long-term disabilities if not managed appropriately (Tan, 2023). Physical therapy has emerged as a vital element in disaster response, facilitating recovery and improving survivors' reintegration into communities (Reinhardt et al., 2011; Tan, 2023). Physical therapists are pivotal in disaster response, providing essential rehabilitative care that prevents disabilities and improves functional outcomes (Xiao et al., 2011; Tan, 2023). Early intervention in disaster settings shortens recovery time, reduces hospital stays, and enhances the quality of life for affected individuals (Adhikari et al., 2018; Chishtie et al., 2019; Tan, 2023). However, physical therapists remain underutilized despite the benefits of their timely intervention—a gap attributed

to insufficient recognition of their roles within disaster management frameworks (Angelucci, 2010; Wolf Williams, 2019; Tan, 2023). Numerous barriers hinder the participation of PTs in disaster response efforts. Personal challenges, such as financial constraints and emotional stress, are common among local and foreign physical therapists (Carvalho et al., 2019; Faanes et al., 2012; Tan, 2023). In contrast, organizational barriers include inadequate resource allocation and a lack of structured roles for PTs in disaster response teams (Cole et al., 2020; Mulligan et al., 2015; Tan, 2023). Moreover, operational challenges like language and cultural barriers often complicate interactions between foreign PTs and local populations (Klappa et al., 2014; Hillel, 2010; Tan, 2023).

On the other hand, facilitators such as organizational solid support and clear role delineation enhance PT participation. Collaborations with non-government organizations (NGOs) and professional associations have been instrumental in integrating PTs into disaster response teams (Millett, 2011; WCPT, 2016; Tan, 2023). Additionally, cross-disciplinary collaboration and pre-deployment training equip physical therapists with the skills needed to navigate the complexities of disaster environments effectively (Cole et al., 2020; O' r n & Roempke Lindstro" m, 2021; Tan, 2023)—underscoring the need for policy interventions that formalize the inclusion of physical therapists in disaster response frameworks. The need for policy intervention also stresses the need to develop standardized training programs and guidelines tailored to the unique demands of disaster settings (Harvey & Skelton, 2015; Lathia et al., 2020; Tan, 2023). Moreover, fostering local capacity through training and collaboration with local physical therapists is critical for sustainable disaster response efforts (Sheppard & Landry, 2016; NEPTA, 2015; Tan, 2023).

Mitchell (2023) states that Emergency Medical Teams (EMTs) play a crucial role during national and international disasters by enhancing response capabilities and ensuring quality care for affected populations. Rehabilitation professionals are increasingly included in EMTs, although their integration into Type I teams is not yet standard practice. Rehabilitation's primary objective is to optimize function and reduce disability for patients across all ages and treatment settings. The SPHERE humanitarian standards advocate for rehabilitation to begin during the acute phase of a disaster. However, rehabilitation services are often delayed or unavailable during emergencies, limiting their potential to reduce long-term injuries and improve functionality (Mitchell, 2023).

Evidence suggests that early rehabilitation interventions, particularly in prehospital and emergency care, can improve outcomes by reducing reliance on imaging and opioid use while enhancing access to care. Despite this, rehabilitation services remain predominantly focused on post-acute care for hospitalized patients or those requiring long-term treatment. A growing body of literature highlights the value of physiotherapy in acute and emergency settings, emphasizing its potential to address gaps in disaster response frameworks (Mitchell, 2023). According to Ojukwu et al. (2021), Nigeria faces a range of disasters like floods, fires, collapsed buildings, epidemics, and oil spills (Atala T., 2011; Ojukwu et al., 2021). A disaster mainly affects vulnerable populations, leaving them with several challenges. Large-scale disasters result in significant numbers of disabling impairments, including spinal cord injuries, traumatic brain injuries, limb amputations, long bone fractures, and peripheral nerve injuries (Navjyot et al., 2017; Ojukwu et al., 2021). Disaster management is a continuous process in the country, carried

out by various departments and units under the National Emergency Management Agency (NEMA) (National Emergency Management Agency, 2020; Ojukwu et al., 2021). In the initial phase of disaster management (DM), physiotherapists demonstrated a greater understanding of their responsibilities in creating disaster management plans than preparing for emergencies within their specific practice areas or communities. Both aspects of disaster planning are crucial and necessitate the active participation of physiotherapists. Nonetheless, the engagement of physiotherapy in the first stage of disaster management in Nigeria is minimal (Harrison RM, 2007; Trivedi et al., 2017; Ojukwu et al., 2021).

Physiotherapists knew their role in disaster management, providing acute rehabilitation for injured individuals. Nevertheless, their involvement in these functions did not align with their knowledge and expected role. Furthermore, physiotherapists in other countries reported that their roles in disaster response stages were often poorly defined (Harrison RM, 2007; Trivedi et al., 2017; Nepal Physiotherapy Association, 2015; Ojukwu et al., 2021). Physiotherapists in Nigeria demonstrated good knowledge regarding their specific roles during the last stage of disaster management, often seen as rehabilitation specialists—this has restricted their role to the recovery stage of conditions. In contrast, physiotherapists in other countries are involved in long-term rehabilitation—highlighting the need for more comprehensive care for people with disabilities, injuries, surgical issues, mental health, and emergencies during the recovery stage (WHO, 2013; Ojukwu et al., 2021). Integrating physiotherapists into the functions of the National Emergency Management Agency (NEMA) and all levels of the Nigerian healthcare system is recommended to enhance the effectiveness and outcomes of DM initiatives in the country (Ojukwu et al., 2021).

Disaster Preparedness and Management

According to Koca and Topak (2024), most countries worldwide have experienced earthquake disasters that caused severe architectural and human losses over time. However, countries that can make a plan for earthquake management will cope in a better way with the next disaster—demonstrating the reports based on the incident of the earthquake-affected areas, conducting descriptive studies, providing the inadequacies of the rescue mission, analyzing the characteristics of injuries and its treatment approaches will help in the planning and preparation for the occurrence of future earthquakes (Koca & Topak, 2024). According to the Turkish Red Crescent Society report, two major earthquakes occurred on February 6, 2023, with respective magnitudes of 7.7 and 7.6 in the city of Kahramanmaraş, Türkiye—with reported injuries of more than 122,000 people and no less than 50,783 deaths. For these reasons, it is crucial to identify the total amount of victims and their first aid for injuries and needs—to provide the appropriate team and resources for the earthquake victims in the post-earthquake period. Moreover, during the acute period after the earthquake, several injuries, such as superficial, open, and closed fractures and open wounds—were observed in earthquake victims.

In addition, some of the patients also suffered amputation surgery, fasciotomy, tendon and soft tissue repair, neurovascular repair, fixation, and fracture reduction—with some of the injuries suffered alongside an infection (Koca & Topak, 2024). In the intermediate period after the earthquake, most of the patients consisted of (1) lower extremity amputees, (2) patients who developed detriment of strength in their lower extremity because of vertebral fracture and spinal cord injuries, (3) patients who suffered pelvic and extremity fractures, (4) patients with drop foot

due to the peroneal damage, (5) patients with brachial plexus damage, (6) patients who have problems in mobilization of limbs (Koca & Topak, 2024). In the long term period, victims who have moral and severe resource losses require psychological and physical support—along with some patients who suffer a post-earthquake dizziness syndrome—which affects their everyday lives negatively (Kumar & Bhavana, 2018; Koca & Topak, 2024). In addition, psychological and physical stress affects the person's success and adaptation in rehabilitation—determining the profiles and needs of these individuals should be a part of rehabilitation goals (Koca & Topak, 2024). Furthermore, the appropriate rehabilitation approach toward these individuals aims to produce utilitarian recovery with early intervention, reduce complications, and readapt the individual to society (Merin et al., 2015; Kocyigit, 2023; Koca & Topak, 2024).

According to Chua and Obra (2022), the Philippines is highly vulnerable to natural hazards and disasters—ranking 8th in disaster risk and 9th in disaster exposure globally in the 2021 World Risk Report (Aleksandrova et al., 2021; Chua & Obra, 2022). The Philippines was also identified as the 17th most affected nation by extreme weather events in the Global Climate Risk Index (Eckstein, 2021; Chua & Obra, 2022). This vulnerability stems from the nation's exposure to typhoons, earthquakes, tsunamis, and volcanic activity, exacerbated by its location within the Pacific Ring of Fire and inadequate natural barriers (Center for Excellence in Disaster Management & Humanitarian Assistance, 2018; Chua & Obra, 2022). Typhoons are the most destructive natural hazard in the Philippines, often leading to storm surges, floods, and landslides. Meanwhile, earthquakes and volcanic hazards pose significant risks due to the country's seismic activity (International Federation of Red Cross and Red Crescent Societies [IFRC], 2021; Chua & Obra, 2022).

Natural hazards—often interchanged with natural disasters, can only be classified as such when a human settlement cannot cope with their impacts (Mizutori, 2020; Chua & Obra, 2022). This notion applies to the Philippines, where insufficient adaptation and coping mechanisms exacerbate the impacts of natural hazards (Aleksandrova et al., 2020; Chua & Obra, 2022). Natural disasters significantly impact communities through property loss, displacement, and disruption, often leading to death, disability, and mental trauma (Jha et al., 2018; Chua & Obra, 2022). Vulnerable populations, including persons with disabilities (PWDs) and the elderly, are disproportionately affected due to limited access to resources (UNISDR, 2014, as cited in Rohwerder, 2015; Chua & Obra, 2022) and exclusion from disaster management planning (Guddo & Ramesh, 2020; Chua & Obra, 2022). Physical therapists, as experts in rehabilitation, have a critical role in improving disaster recovery efforts and advocating for inclusive disaster planning that addresses the needs of these groups.

World Physiotherapy (formerly WCPT) emphasizes the role of physical therapists in disaster preparedness and management, advocating for their involvement in emergency responses and post-disaster interventions (WCPT, 2016; Chua & Obra, 2022). The expertise of physical therapists' including triage, clinical care, education, and community outreach, make them valuable contributors to disaster situations (Klappa et al., 2013, as cited in WCPT, 2016). Physical therapists' expertise in triage, clinical care, patient and caregiver education, and community outreach makes them valuable contributors to disaster situations (Klappa et al., 2013; Chua & Obra, 2022). They serve as essential links between hospital and community health services, forming part of a multidisciplinary approach to disaster management (WCPT, 2016;

Chua & Obra, 2022). Despite the recognized value of physical therapists in disaster risk reduction and management (DRRM), their involvement in the Philippines remains limited and underutilized. The roles of physical therapists are often poorly defined, limiting their effectiveness (Trivedi & Rathod, 2018; Chua & Obra, 2022)—highlighting the need for greater awareness and integration of physical therapy within local disaster management frameworks. According to Sofyana et al. (2024), Indonesia experiences a high frequency of natural disasters, with significant fluctuations in the number of events each year. In 2020, there were 3,544 disaster events, averaging ten daily—and this increased in the following year, equating to 5,402 disaster events, nearly 15 a day. However, in 2022, the frequency declined to 4,650 events, averaging 13 daily—highlighting Indonesia's vulnerability to natural disasters and the ongoing challenge of managing disaster response and recovery nationwide (Adi A., 2021; Sofyana et al., 2024). In 2021, Indonesia experienced approximately 5,400 natural disasters—a significant increase from 2,500 events reported in 2018. As a result of these disasters, over 21,000 residential buildings suffered severe damage. This data highlights a growing trend in disaster frequency and the substantial impact on housing infrastructure in the country (Statista Research Department, 2021; Sofyana et al., 2024). In addition, until March 2022, non-natural disasters due to the COVID-19 pandemic still became a problem (Suryotomo P, 2022; Sofyana et al., 2024).

To address Indonesia's high disaster frequency, the policy focus for 2020–2024 is on enhancing disaster management resilience to support sustainable development and achieve long-term prosperity. This orientation emphasizes preparedness, risk reduction, and robust response strategies to minimize disaster impacts and promote resilient communities (BNPb. Rencana Nasional Penanggulangan Bencana 2020–2024, 2019; Sofyana et al., 2024). Integral factors in increasing disaster management resilience include community preparedness and the capacity to protect themselves. Disaster education aims to raise awareness of risks through preparedness training—enhancing individuals' ability to save themselves in times of crisis. Social cohesion, cooperation, and trust are essential values of social capital that strengthen people and residents in preparing, responding, and recovering from disasters (Amri et al., 2016; Sofyana et al., 2024). Creating a community-based disaster mitigation system begins with understanding how local communities recognize disasters. By increasing the capacity of these communities, mitigation efforts can be more effective. Lack of community knowledge is a significant factor in ineffective disaster mitigation. Therefore, promoting community preparedness is crucial in reducing the impact of disasters and minimizing the number of victims (Santoso et al., 2019; Sofyana et al., 2024). A community empowerment model is crucial for disaster risk reduction, particularly in meeting the needs of independent community health services. Disasters often lead to health crises, including casualties, injuries, refugees, and various health issues. Addressing these challenges demands a comprehensive system involving multiple sectors to ensure adequate response and recovery efforts (Ren ZJ et al., 2017; Sofyana et al., 2024).

Disaster Response

According to Bosmans et al. (2022), disasters and significant crises threaten populations worldwide, causing millions of deaths, injuries, and displacement. Rapid Needs Assessments (RNAs) are crucial for disaster relief organizations to collect information quickly and without bias, addressing the various needs of survivors (Bosmans et al., 2022). Governments and public leaders involved in disaster relief efforts must prioritize the needs of those affected to inform

their decision-making—ensuring tailored help for the unique needs of individuals and communities (Dückers et al., 2017; Bosmans et al., 2022). A match between disaster-affected needs and assistance offered is not automatic. Additionally, 'Tarmac bias' occurs when aid primarily reaches easily accessible areas, leaving others without proper assistance (Benigno et al., 2015; Bosmans et al., 2022). Needs assessments are crucial in understanding the type and urgency of the needs of affected populations after a disaster. Rapid needs assessments are essential in the immediate aftermath of a disaster and the longer term when needs remain acute. While thorough data collection is valuable, it may not always be practical in emergencies where quick responses are needed to prevent further harm. Rapid needs assessments provide a snapshot of the needs and problems of affected individuals within a short timeframe, typically one to two weeks. Unlike disaster health studies, which focus on specific health issues and risk factors using scientific methods after a disaster, RNA focuses on quickly identifying the needs of those affected to guide policymakers in providing necessary assistance and care (Bosmans et al., 2022). Furthermore, RNA is concerned with understanding who is affected and their immediate and future needs rather than delving into individual recovery factors. By focusing on group needs and utilizing existing data on risk and protective factors, RNAs can gather essential information quickly to inform relief efforts. While disaster health research is more intensive and time-consuming, RNA offers a pragmatic alternative for quickly assessing needs and determining the need for further health research. Overall, disaster health research and rapid needs assessments aim to address the needs of affected populations and optimize their recovery process. While they may differ in methodology and scope, both approaches are critical in responding effectively to disasters and providing necessary support to those in need (van der Velden et al., 2012; Bosmans et al., 2022).

Otto et al. (2022) stated that the effect of COVID-19 on hospitalized patients is extensive, with shortness of breath due to hypoxia being the primary cause of admission. Besides respiratory difficulties, patients often experience significant muscle weakness—which can negatively affect different aspects of their daily lives. This weakness may impair their gait, hinder activities of daily living, and negatively affect functions such as speech, cognitive linguistics, or swallowing (Otto et al., 2022). In response to the pandemic's challenges, the US Public Health Service Commissioned Corps deployed a dedicated rehabilitation team comprising physical and occupational therapists and speech-language pathologists. During their COVID-19 support mission, the physical therapist focused on improving strength, positioning, and transfers for 8 to 10 patients daily in an in-patient setting. Their goal was to restore mobility for patients recovering from COVID-19 symptoms and minimize injury risks upon returning home. The therapist also assisted with discharge planning, including assessing the need for assistive devices or additional equipment at the discharge location (Otto et al., 2022).

Physical therapists are crucial in responding to major health events like the COVID-19 pandemic and natural disasters (Wittmeier et al., 2020; Otto et al., 2022); they assist patients in recovering from injuries namely fractures, amputations, and spinal cord injuries following such emergencies. Early rehabilitation interventions for critically ill patients have proven effective in enhancing recovery, aiding hospital discharge, and reducing costs (Ramalingam et al., 2020; Otto et al., 2022). COVID-19 patients often experience respiratory distress requiring complex treatment. Physical therapists collaborate with a multidisciplinary team to assess and treat patients, design rehabilitation plans, offer physical conditioning and mobility exercises, and evaluate the home

environment for a safe return. The expertise of physical therapists is vital in facilitating optimal recovery for individuals with COVID-19 and other respiratory and neuromuscular conditions (Mousavi et al., 2019; Otto et al., 2022). By educating the medical team and providing rehabilitation services, therapists can provide holistic care for patients with needs. The rehabilitation team provided critical support at the hospital overwhelmed with COVID-19 patients—enhancing the overall quality of care. Their interventions addressed patients' needs, ultimately improving health outcomes (Otto et al., 2022). Following the arrival of the rehabilitation team, the patients showed remarkable improvements. They have shown increased mobility and greater independence in their daily activities. Additionally, patients could tolerate the least restrictive diets without showing signs of aspiration, highlighting the effectiveness of integrating therapeutic disciplines into patient care. Therefore, it is imperative for leadership involved in developing and deploying medical teams for military, emergency response, and public health efforts to recognize the crucial role that all therapy disciplines play in enhancing patient care (Otto et al., 2022).

According to the Centre for Research on the Epidemiology of Disasters, as cited by Amatya and Khan (2023), the Philippines is one of the most disaster-prone countries, emphasizing efficient rehabilitation efforts to support affected communities. The country experiences natural disasters frequently—leading to many injuries and long-term disabilities (CRED, 2020; Amatya & Khan, 2023). Physical therapy plays an integral role in disaster response by (i) helping survivors, (ii) addressing rehabilitation needs, (iii) recovering functional independence, and (iv) improving quality of life (Amatya & Khan, 2023). Research shows that the early involvement of rehabilitation professionals, including physical therapists, improves recovery outcomes for disaster survivors. In contrast, institution-based rehab for Sichuan earthquake survivors improved physical function and quality of life significantly (Li et al., 2015; Amatya & Khan, 2023). Community-based psychological programs effectively reduced emotional distress among tsunami survivors, highlighting the need for integrated services in disaster response (Becker, 2009; Amatya & Khan, 2023).

The World Health Organization (WHO) recognizes rehabilitation as a core component of trauma care systems, advocating for the inclusion of rehabilitation services in emergency medical teams (WHO, 2016; Amatya & Khan, 2023). Rehabilitation should start early in disaster response and continue during recovery. Physical therapy in multidisciplinary teams is key for holistic care—meeting survivors' physical and psychological needs (Amatya & Khan, 2023). Despite the recognized importance of rehabilitation, there remains a lack of standardized guidelines for the role of physical therapists in disaster response. The Lack of clear protocols and training for rehabilitation professionals in disasters can delay immediate and adequate response (Rathore et al., 2015; Amatya & Khan, 2023). Developing specific guidelines that outline the responsibilities of physical therapists in disaster scenarios is crucial for improving rehabilitation outcomes and ensuring that survivors receive timely and appropriate care (Khan et al., 2019; Amatya & Khan, 2023). Integrating physical therapy into disaster response frameworks is essential for enhancing recovery and resilience among affected populations. Various studies show that early and coordinated rehabilitation efforts can significantly improve disaster survivors' functional outcomes and quality of life (Li et al., 2015; Becker, 2009; Amatya & Khan, 2023).

Importance of Rehabilitation during Crises

According to Gosling (2023), traumatic injuries reported due to unexpected disasters and transmissible diseases cause a hike in the demands of aiding products and rehabilitation facilities (Mills et al., 2018; Gosling et al., 2023). However—in responding to the surge in rehabilitation needs, the healthcare system experienced a challenge because of the rapid depletion of the healthcare workforce, damage to infrastructures and supply chains, and reduced delivery of rehabilitation services (Kruk et al., 2010; Gosling et al., 2023). With this, the demand for rehabilitation services must be addressed, as inaccessible rehabilitation services can result in life-changing and socioeconomic impacts for people affected (Gosling et al., 2023). Moreover, accessing high-quality and timely rehabilitation services can make a change—as it can help to lessen complications and decrease the needed length for hospitalization (WHO, 2017; Gosling et al., 2023).

With these challenges, people in low and middle-income countries are most vulnerable during the outbreak of diseases and disasters—which shines a light on the importance of rehabilitation when these emergencies occur. Moreover, due to these unexpected challenges—the Ministries of Health decided to focus more on rehabilitation in the context of health planning, increasing the allocation of funds and broadening the development of rehabilitation services (Gosling et al., 2023). According to the World Health Organization, the steps in fortifying rehabilitation response to an emergency should be reflected in the Rehabilitation 2030 Call for Action, which states that rehabilitation should be incorporated into healthcare (WHO, 2017; Gosling et al., 2023). Furthermore, integrating rehabilitation in health emergency preparedness and health planning in health care systems would strengthen efforts and provide long-term development as rehabilitation is the priority in the recovery stage or the "building back better" stage (Gosling et al., 2023).

According to Güç et al. (2024), an earthquake happened in the province of Kahramanmaraş in Türkiye with a magnitude of 7.8 on February 6, 2023; that was considered the most intense earthquake in more than 80 years in Türkiye. The earthquake was recorded to be one of the most disastrous disasters in Türkiye—causing enormous damage to the country (Güç et al., 2024). Moreover, its numerical data in 2023 of the Kahramanmaraş earthquake also shows an increase of three times in the number of injured people compared to the reported deaths. As this earthquake happened, 220 patients were hospitalized, consulted, and examined in the physical therapy unit. The most common extremity injury was reported in 183 patients, with the lower extremities most commonly affected (Güç et al., 2024). Earthquakes may have a low percentage in the total amount of disasters around the world—but it is still considered among the events that can be fatal and cause a large number of fatalities and injuries (Mavrouli et al., 2023; Güç et al., 2024). With this—careful planning, providing necessary precautions, effective intervention, and a comprehensive plan can decrease the amount of recorded injuries and fatalities during disasters within the first 6 hours after an earthquake—as the local health system may not be able to keep up with the surge of demand during a severe earthquake or disaster. Furthermore, with proper and careful planning for the healthcare system and hospitals for the earthquake or disaster—improved healthcare can be offered to injured patients (Güç et al., 2024). According to Souza et al. (2022), one of Brazil's worst environmental and humanitarian tragedies occurred on January 25, 2019, with the collapse of the Mina Córrego do Feijão dam—which belongs to the mining

company Vale SA. The incident occurred in Brumadinho, Minas Gerais—the collapse caused an avalanche of mining waste, which led to 259 confirmed deaths and 11 missing persons as of March 2020 (Giradi et al., 2020; Souza et al., 2022). Public security forces, including the Military Firefighters Brigade and troops from various states and Israeli military forces, responded to a disaster in Brazil. The rescue operations led to physical strain on the military workers, increasing the risk of musculoskeletal dysfunction. Various organizations have implemented a joint initiative involving physical therapists to provide services to military firefighters, addressing the issue of musculoskeletal dysfunction.

Beginning on February 10, 2019, two teams of physical therapists, one military and one civilian, provided care at different locations in Brumadinho and Córrego do Feijão. 19 Polícia Militar de Minas Gerais (PMMG) and 26 civilian physical therapists were involved, working continuously for 48 days before Vale S. A. hired additional therapists to continue providing care (Souza et al., 2022)—this collaborative effort aimed to manage and address the physical strain on the military workers involved in the disaster response operation (Giradi et al., 2020; Souza et al., 2022). The initiative to provide physical therapy to military workers involved in search and rescue operations was a unique effort, both nationally and internationally. Physical therapists work in teams providing urgent care to disaster victims (Nixon SA et al., 2010; Blanchet K et al., 2014; Faanes et al., 2012; Khan F et al., 2015; Souza et al., 2022)—nonetheless, lack an established role during emergency response to natural disasters (Trivedi NS et al., 2017; Waldrop S., 2002; Souza et al., 2022). According to Doğan & Akbayrak (2024), natural disasters are disruptions caused by nature that impact daily life, harming life forms and infrastructure. Recovering is challenging for affected communities due to losses (Işık et al., 2015; Doğan & Akbayrak, 2024). During disasters, women are affected by more health problems than men (Enarson et al., 2012; Doğan & Akbayrak, 2024). Natural disasters significantly compromise a woman's sexual and reproductive health. Furthermore, there may be challenges in accessing necessary healthcare services (Doğan & Akbayrak, 2024).

Research has identified several prevalent issues that women may face in the aftermath of such events. These include a decline in genital hygiene and an increased likelihood of developing pelvic inflammatory syndrome, as well as menstrual disturbances and a heightened risk of premature births among pregnant women. Additionally, there may be disruptions in birth control methods, resulting in unintended pregnancies, alongside a rise in low birth weight among newborns. Furthermore, new mothers might encounter difficulties with their babies' breast milk intake, and issues related to pelvic floor dysfunction may also arise (Enarson et al., 2012; Doğan & Akbayrak, 2024).

Physiotherapy and rehabilitation methods play a crucial role in helping women in the post-disaster period adapt to daily life, maintain genital hygiene, manage menstrual pain, prevent risky pregnancy situations, educate expectant mothers on childbirth, support postpartum recovery, address breastfeeding challenges, treat pelvic floor dysfunctions, and improve overall well-being. These programs, including edema/lymphedema management and reduction of menopausal symptoms, are essential for women in society to enhance their quality of life post-disaster. Physiotherapists actively provide these services to women in disaster-affected areas, supporting their recovery and overall well-being (Doğan & Akbayrak, 2024).

Integration of Physical Therapy

According to Khan and Amatya (2021), natural and man-made disasters rapidly grow worldwide and usually occur in regions with limited and insufficient resources—accounting for 90% and 98% of affected people and fatalities, respectively (Amatya et al., 2017; Khan & Amatya, 2021). The impact of these disasters on the well-being of people and communities is heightening—which causes the role of Physical and Rehabilitation Medicine (PRM) to be considered vital in addressing disaster management systems. PRM needs to be integrated during emergency response for the continuity of support for an extended period until all the treatment goals are attained and the survivors can effectively function back into society (Khan & Amatya, 2021). Moreover, rehabilitation is vital in its involvement in all disaster management phases—which include (1) mitigation/prevention, (2) preparation, (3) response, and (4) recovery (Khan et al., 2019; Khan & Amatya, 2021). However, the capable rehabilitation labor force and services are still insufficient in several disaster-prone countries—which causes a strain on rehabilitation for individuals, their families, and the community (Khan et al., 2019; Rathore et al., 2012; Khan & Amatya, 2021).

In addition, during the last decade, various leaderships, such as the World Health Organization, the United Nations, and the Office for the Coordination of Humanitarian Affairs—created collaborative efforts and international partnerships to bring substantial developments in disaster response and management which include the implementation of acute medical and rehabilitation care to successfully offer services, minimize inequalities, and organization in international relief efforts during disasters (Amatya et al., 2017; Khan et al., 2019; Khan & Amatya, 2021). Along with that, the International Society of Physical and Rehabilitation Medicine also collaborated with the World Health Organization with a key mission of helping physicians and researchers in Physical and Rehabilitation Medicine to (1) hone and develop their skills in providing optimal patient care, (2) enhance the capabilities and developments of national organizations, (3) collaborate with various international organization to improve and achieve efficient policies in rehabilitation and disability, (4) promote partnerships with various governments and nongovernmental organizations, (5) private sectors, and (6) persons with disabilities (Khan & Amatya, 2021) with its priority in reducing acquired disabilities and improving the quality of life of the survivors of disasters that obtained traumatic injuries and those with preexisting disability during disasters (Disaster Rehabilitation Committee (DRC) – ISPRM, 2016; Khan & Amatya, 2021).

These collaborations and partnerships advocate for investment in rehabilitation infrastructure and workforce from an international perspective that contributes to the development of the people's health, economic state, and social development with its overall purpose to provide comprehensive and compatible care to the survivors in the aftermath of a disaster, to strengthen and expand the capacity of local rehabilitation areas for forthcoming disasters—and to advance the rehabilitation policy and practice globally (Khan & Amatya, 2021). However, in low and middle-income countries and disaster-prone areas, rehabilitation professionals are still lacking, and comprehensive and inclusive rehabilitation in disaster management plans is still yet to be developed (WHO, 2017; Khan & Amatya, 2021). With this, the Disaster Rehabilitation Committee and World Health Organization Liaison Committees acknowledged the need to strengthen the capability of rehabilitation through training and education to broaden the skilled

workforce and improve the knowledge about rehabilitation in order to provide efficient planning and complete management of survivors in the future disasters (WHO, 2017; Khan & Amatya, 2021). Furthermore, there is a crucial need to know the current situation and state of rehabilitation services—as there is an urgent demand to develop a sustainable workforce, train and educate the present workforce, advance and implement evidence-based guidelines, strengthen policies and protocols, and producing relevant data on the effectiveness of rehabilitation interventions (Khan & Amatya, 2021). According to Gosling (2024), conflicts and disasters lead to traumatic injuries like fractures, burns, and amputations, increasing the demand for rehabilitation and assistive technology for patients with spinal cord and crush injuries (Mills et al., 2018; Gosling, 2024). Without meeting the surge in rehabilitation needs, the health system can be quickly overwhelmed, hindering access to services and delaying crucial interventions; this can have long-lasting consequences, potentially leading to disability that lasts for years (Khan et al., 2015; Gosling, 2024). The World Health Organization (WHO) defines rehabilitation as interventions to improve functioning and reduce disability in individuals with health conditions (WHO, 2017; Gosling, 2024). WHO also considers rehabilitation crucial for universal health coverage and vital for emergency response (WHO, 2010; Gosling, 2024). The 2023 landmark World Health Assembly resolution EB152/10 emphasizes integrating rehabilitation into emergency preparedness and response plans to ensure timely and practical support. Rehabilitation plays a crucial role in disaster response, as recognized by global guidelines. Early rehabilitation can minimize disability and enhance quality of life. In the long run, investing in rehabilitation enables individuals to engage in various aspects of society, like family, education, and work (WHO, 2017; Gosling, 2024).

Gosling (2024) suggested focusing on four priority areas: early and multi-professional rehabilitation, disaster response training for professionals, advocacy efforts, and integration of rehabilitation into disaster preparedness. Resources like the WHO World Rehabilitation Alliance can help implement these recommendations. According to Clark et al. (2022), Direct access (DA) to physical therapy in the U.S. military has proven to be a highly effective model for managing musculoskeletal conditions. Since its inception in 1972, military physical therapists (PTs) have been granted roles as primary care providers for neuromusculoskeletal issues—including performing evaluations, referring for imaging, and even prescribing certain medications under specific training programs. Physical therapists outperformed other healthcare providers, except orthopedic surgeons, in managing musculoskeletal conditions (Childs et al., 2005; Clark et al., 2022). Their management of patients has shown to be practical and safe, with no adverse events reported over 40 months of DA implementation (Moore et al., 2005; Clark et al., 2022). Military PTs have consistently delivered cost-effective care. In combat, patients under PT care required fewer medications and less imaging and had higher return-to-duty rates than those managed by family physicians (McGill T., 2013; Clark et al., 2022). Furthermore, PT-led care at Combat Support Hospitals returned nearly all patients to duty, avoiding costly evaluations (Moore et al., 2013; Clark et al., 2022).

While DA is available to varying extents in all U.S. states, only 20 states offer unrestricted DA, limiting the full potential of autonomous practice. Civilian PTs face significant barriers, including a lack of privileges to order imaging and prescribe medications—even though direct access in civilian settings is safe and effective, reporting no adverse events (Mintken et al., 2015; Clark et al., 2022). Also, patients accessing physical therapy through direct access required fewer

visits, resulting in lower costs while maintaining similar outcomes (Denninger et al., 2018; Clark et al., 2022). Public awareness of direct access remains a challenge. A Limited understanding of a physical therapist's scope of practice led to most patients preferring medical doctors for treatment (Snow et al., 2001; Kearns et al., 2014; Clark et al., 2022). Efforts to improve public education and advocacy are needed to bridge this gap and enhance the adoption of DA models. The U.S. military provides a successful framework for PTs as primary care providers, demonstrating safety, cost-efficiency, and high patient satisfaction. Expanding direct access privileges in civilian settings, along with advocacy for legislative support and increased public awareness, can enable physical therapists to fulfill their potential as autonomous healthcare providers. Integrating these changes can address the primary care physician shortage while improving access to high-quality musculoskeletal care (Clark et al., 2022).

According to Shamout (2023), exploring global approaches to EMT and rapid response team (RRT) integration, health emergencies like the COVID-19 pandemic stress the need for improved workforce management and operational capacity. Integrating multidisciplinary RRTs and EMTs has shown a potential to enhance emergency response mechanisms. A study involving 16 countries across the six WHO regions examined RRT and EMT programs' management, training, legal frameworks, and operational practices—results revealed areas of divergence with recommendations for strengthening global health emergency response teams (Shamout et al., 2023).

Importance physical therapist

According to Palacios-Ceña et al. (2021), the COVID-19 pandemic—notified by WHO in March 2020- posed unparalleled global challenges for healthcare systems. Physical therapists (PTs) played a critical role in responding to the crisis in Spain. During the pandemic, PTs in Spain transitioned from traditional roles to support overwhelmed healthcare teams. They actively assisted in emergency departments, intensive care units (ICUs), and COVID-19 wards. Many described a sense of professional duty, volunteering to fill gaps and help colleagues with high-risk factors. Participants emphasized that, despite the closure of rehabilitation services, they adapted to new tasks, demonstrating flexibility and dedication to patient care during the crisis (Palacios-Ceña et al., 2021).

Physical therapists likened their experience on the battlefield, facing unpredictable changes and working under severe constraints, such as limited personal protective equipment (PPE). They endured long hours wearing PPE, which they described as both physically and mentally exhausting. Physical therapists also experienced fear and anxiety due to the high risk of infection and the lack of systematic COVID-19 testing at the pandemic's onset. Nevertheless, the camaraderie among healthcare workers stood out as a unifying factor, with professionals collaborating across disciplines to combat the virus (Palacios-Ceña et al., 2021).

Returning home after hospital shifts presented additional challenges for physical therapists, who feared infecting their families. Many implemented self-imposed safety protocols, such as isolation and decontamination routines, to mitigate risks. Participants described the psychological strain of maintaining limited contact with loved ones and the difficulty of maintaining a work-life balance during the lockdown (Palacios-Ceña et al., 2021). The resilience

and adaptability of PTs during public health crises emphasize the need for comprehensive support systems, including access to PPE, mental health resources, and preparedness training. Moreover, the study emphasizes the value of PTs as integral members of multidisciplinary teams during pandemics, capable of addressing immediate and rehabilitative healthcare needs. According to Viloría et al. (2023), patients admitted to the intensive care unit (ICU) have life-threatening conditions—which require frequent monitoring and other specialized treatments (Smith & Nielsen, 1999; Viloría et al., 2023). Patients in these conditions require constant bed rest resulting in physiological changes (Hodgin et al., 2009; Viloría et al., 2023), as well as impaired neuromuscular health (De Jonghe et al., 2002; Viloría et al., 2023)—affecting the patient's physical function (Desai et al., 2010; Viloría et al., 2023). The decline in the patient's physical function typically manifests as weakness (Kayambu et al., 2013; Viloría et al., 2023), fatigue, and difficulty returning to usual activities of daily living. ICU patients' health-related quality of life (HRQoL) is significantly lower than the general public—even after weeks to years of discharge (Rai et al., 2020; Viloría et al., 2023), highlighting how physiological changes affect an individual's health-related quality of life. Physical therapy is vital for managing patients in the ICU facing critical illnesses (Clini & Ambrosino, 2005; Viloría et al., 2023). Different modalities and techniques conducted by physical therapists (Turner & Whitfield, 1999; Viloría et al., 2023)—such as range of motion exercises, functional training, and electrotherapy, help improve the patients' compromised physical function (Verhagen & Engbers, 2008; Viloría et al., 2023). Improving the patients' physical function improves their health-related quality of life (Clini & Ambrosino, 2005; Viloría et al., 2023), indicating that various PT techniques can reverse the complications acquired by the patients in the ICU.

Physical therapy benefits ICU patients, as indicated by the evidence gathered worldwide. The evidence also indicates that PT intervention varies between countries and hospitals because of different treatment protocols and ICU-specific challenges faced by physical therapists. Some of the differences and challenges encountered by physical therapists worldwide are (1) different PT management (Baidya et al., 2016; Viloría et al., 2023), (2) PT concerns such as staffing and training (Malone et al., 2015; Alqahtani et al., 2020; Viloría et al., 2023), (3) patient-related issues—such as prioritization and perception of the importance of PT (Malone et al., 2015; Viloría et al., 2023), (4) staff-related concerns—such as poor interdisciplinary communication (Alqahtani et al., 2020; Dafoe et al., 2015; Viloría et al., 2023), and (5) system-related problems—such as lack of consultation area (Malone et al., 2015; Viloría et al., 2023). The variations and challenges faced by physical therapists in various countries indicate the dissimilarity of each country's healthcare system (Viloría et al., 2023).

Managing patients with life-threatening conditions is challenging, and possessing knowledge about caring for these patients is vital in improving the quality of PT intervention (Viloría et al., 2023). The standard guideline for ICU PT states that experienced physical therapists must be present in the ICU (ICS, 2019; Viloría et al., 2023). However, studies report that physical therapists have varying durations of ICU experience—ranging from (1) no experience (Sigera et al., 2016; Alqahtani et al., 2020; Viloría et al., 2023), (2) a mean of 6 years (Çakmak et al., 2019), and (3) 10 years of experience (Sigera et al., 2016). Most physical therapists are not permanently in the ICU (Viloría et al., 2023), even though standard guidelines state that on-call physical therapists must be present to respond to the needs of patients with life-threatening conditions (ICS, 2019; Viloría et al., 2023)—highlighting insufficient ICU physical therapists. ICU physical

also encounters a lack of knowledge about the importance of physical therapy (Al-Nassan et al., 2018; Vilorio et al., 2023) and the need for a physician's referral, limiting direct access to physical therapists (Duncan et al., 2015; Vilorio et al., 2023). Additionally, the limited availability of ICU-related PT training results in insufficient trained physical therapists (Malone et al., 2015; Vilorio et al., 2023), which does not comply with the international standards that require ICU physical therapists to train to guarantee quality PT services (ICS, 2019; Vilorio et al., 2023). Keller et al. (2023) state that the increasing demand for efficient healthcare delivery has led to discussions around direct access to physiotherapy, particularly in the Swiss healthcare system. Direct access allows patients to seek physiotherapy services without a physician's referral, which may reduce waiting times and improve patient satisfaction (Keller et al., 2023). Also, direct access models can lead to cost savings and better health outcomes than traditional referral-based systems (Demont et al., 2021; Hon et al., 2021; Keller et al., 2023).

In Switzerland, however, the implementation of direct access remains a topic of debate, with concerns regarding the ability of physiotherapists to adequately screen for red flags and make informed clinical decisions (Konrad et al., 2017; Lackenbauer et al., 2017; Keller et al., 2023). In contrast, Swiss physiotherapists' diagnostic and decision-making abilities in a simulated direct access setting revealed that overall, physiotherapists achieved a 55% accuracy rate in diagnoses and a 71.2% accuracy rate in management decisions—emphasizing significant differences in performance across case scenarios, with critical medical cases yielding the lowest accuracy rates (40.5% for diagnoses and 62.3% for management decisions) (Keller et al., 2022). Factors influencing diagnostic accuracy included (i) the level of academic education, (ii) professional experience, and (iii) the proportion of musculoskeletal patients treated in practice. Specifically, higher academic qualifications and more extensive experience were associated with improved diagnostic and decision-making abilities, particularly in musculoskeletal and non-critical medical scenarios (Keller et al., 2023). These factors underline the significance of continuous education and training in enriching physiotherapists' competencies in recognizing clinical danger signs and making appropriate referrals when necessary.

According to Abe et al. (2024), natural disasters like earthquakes pose significant challenges to affected communities. Providing care to vulnerable groups, like older adults, is crucial during the immediate aftermath of a disaster (Rivera JD., 2020; Abe et al., 2024). Vulnerable populations face health risks during disasters and evacuations due to limited resources (Marshall J. et al., 2020; Abe et al., 2024). Residents post-Great East Japan Earthquake faced varied health issues due to evacuation (Tsubokura M., 2018; Abe et al., 2024). Providing urgent medical care to victims in the aftermath of such events is a critical necessity (Timalsina et al., 2020; Abe et al., 2024). The 2011 earthquake in Japan significantly impacted elderly and disabled populations, prompting the government to require welfare shelters in all municipalities by 2013 (Disaster Management COI, 2022; Abe et al., 2024).

Welfare shelters in Wajima City, Japan, played a crucial role in the aftermath of the 2024 Noto Peninsula earthquake, especially for vulnerable populations like older adults and persons with disabilities. As of 2021, nearly half of Wajima's residents belong to the old adult age group—ranging from 65 years and older—making effective disaster response strategies essential. The earthquake, which struck on January 1, 2024, caused widespread infrastructure damage, including disruptions to transportation, water supply, and communication networks. Given these

challenges, welfare shelters prioritized individuals who require special attention—as designated by the city—offering crucial daily support to the affected residents during the immediate aftermath of the disaster. These shelters became essential hubs for those in need, particularly elderly individuals who may have faced more significant challenges during evacuation and recovery (Cabinet Office GoJ., 2024; Abe et al., 2024). The northern segment of Ishikawa Prefecture experienced rescue and aid distribution delays post-earthquake. The region also has a shortage of full-time physicians, requiring collaboration with nearby medical facilities to maintain local healthcare services (Prefecture I., 2024; Abe et al., 2024).

Within the context of the fragile medical system in the region, welfare shelters assumed a pivotal role in providing temporary accommodation and essential resources to evacuees (Disaster Management COiJ., 2022; Abe et al., 2024). Earlier studies have emphasized the pivotal role of physical therapists in disaster response and recovery, showcasing the contribution of their skills and involvement within disaster teams in aiding evacuees and coordinating efforts during disasters (Trivedi N., 2018; Abe et al., 2024). Moreover, prior studies advocate for early rehabilitation interventions for evacuees injured in natural disasters to ameliorate disability and enhance clinical outcomes. The evacuees have an elevated risk of needing long-term care due to evacuation, emphasizing the importance of physical therapists at disaster sites. Despite recognizing the significance of physical therapy during disasters, the involvement of physical therapists in welfare shelters immediately after earthquakes is not well understood. Limited research exists on the challenges encountered by physical therapists in delivering care in post-disaster welfare shelter settings, hindering the refinement of disaster response strategies. This report details the role and experiences of physical therapists in a welfare shelter during the Noto Peninsula earthquake in Ishikawa Prefecture, Japan, aiming to provide insights to enhance future disaster-response strategies (Reinhardt JD et al., 2011; Moriyama N. et al., 2022; Abe et al., 2024).

Kahraman (2023) stated that natural disasters such as earthquakes are often correlated with significant amounts of mortality and morbidity that result in prolonged disabilities that demand specific rehabilitation services (Rathore et al., 2012; Kahraman, 2023). One of the disastrous impacts of earthquakes is spinal cord injury—which can cause a severe psychological, physical, and social impact on individuals and families that are affected (Bhattarai et al., 2018; Landry et al., 2010; Kahraman, 2023). With this, physiotherapy and rehabilitation both have a crucial part in the process of rehabilitation of patients who suffered a spinal cord injury and play an essential part in maximizing functional outcomes, improving the living conditions of patients, and reducing long-term disability (Kahraman, 2023). However, although physiotherapy and rehabilitation play an essential role in managing post-earthquake SCI, the accessibility to specialized rehabilitation services is often insufficient or limited in low and middle-income countries where earthquakes usually happen (Burns et al., 2012; Kahraman, 2023). In addition, the insufficient resources and infrastructures and the high expenses of acquiring specialized rehabilitation can hinder the delivery of effective and inclusive rehabilitation services (Bright et al., 2018; Kahraman, 2023). Moreover, a comprehensive understanding is essential in the post-earthquake pathophysiology of spinal cord injury to devise a strategy in order to have effective prevention, diagnostic, and therapeutic approaches that enhance the results of patients who suffer spinal cord injury. In addition, most rescuers in the earthquake are often unskilled and unaware of the importance of spinal immobilization for survivors who are suffering from back and neck

injuries—that can result in acute injury, and spinal cord injury after an earthquake can cause tissue remodeling and chronic degeneration (Kahraman, 2023). Timely and accurate clinical and functional assessments—physical examination, imaging studies, and neurologic evaluations—are crucial to evaluate the severity and degree of SCI after an earthquake (Kahraman, 2023). The physical examination encompasses assessing the level of consciousness, vital signs, and the presence of musculoskeletal injuries. Imaging studies include radiography, computed tomography (CT), and magnetic resonance imaging (MRI)—which can diagnose and locate the SCI (Hachem et al., 2017; Kahraman, 2023) by visualizing the spinal cord and the surrounding structures to detect edema, hemorrhage, and contusion (Bozzo et al., 2011; Kahraman, 2023). Electromyography, an Electrophysiological test, and nerve conduction studies measure nerve and muscle function and evaluate the severity and extent of the injury—differentiating complete and incomplete SCI to evaluate the possibility of recovery (Schurch et al., 2003; Kahraman, 2023). Assessments also ensure that physiotherapists conduct effective rehabilitation interventions by identifying key problems, forming realistic goals, and predicting results. Post-earthquake management of SCIs involves multidisciplinary practices, such as pharmacotherapy, surgical interventions, stem cell therapy, and rehabilitation. Rehabilitation—physiotherapy, occupational therapy, and speech therapy—aims to optimize the patient's physical function, prevent additional complications, and improve their quality of life. Additionally, a fundamental aspect of rehabilitation following post-earthquake SCI is early mobilization. Early mobilization helps decrease spasticity and prevent contracture—while considering the patient's spine's stability (Kahraman, 2023).

Physiotherapists rehabilitate patients during post-extubating periods via proper positioning, allowing the use of accessory muscles for inspiration and expiration, which is necessary for better ventilation and breathing patterns. Proper positioning, as well as appropriate wheelchair seating, also helps support upright sitting when the trunk muscles are frail (Crytzer et al., 2016; Kahraman, 2023). On the other hand, secretion mobilization—which aids patients with expiratory muscle weakness—comprises postural drainage, coughing techniques, and specific breathing techniques such as the active breathing cycle and autogenic drainage (Kahraman, 2023). Furthermore, standard techniques used to treat SCI-induced contractures are stretching exercises and passive range of motion—yet the heterogeneity present in studies and short follow-up periods provided weak evidence regarding the effectiveness of these treatments. However, high doses over prolonged periods proved effective for the treatment, suggesting that the patient's daily routine should include passive range of motion, stretching exercises, and proper positioning. Such intervention makes caregiver education a vital component of rehabilitation by assisting physiotherapists with the time-consuming treatment (Kahraman, 2023). The time between injury and intervention is a crucial element influencing recovery outcomes. Timely intervention with pharmacotherapy and rehabilitation is associated with better recovery outcomes, as it can prevent secondary complications and promote neuroplasticity (Kahraman, 2023).

METHODOLOGY

Research Design

The study utilized a qualitative research and development design following the input-process-output framework approach. The researchers conducted a Focus Group Discussion (FGD) among licensed physical therapists and the local disaster control office members, the City Disaster Risk

Reduction and Management Office (CDRRMO) of Biñan. The FGD primarily aimed to gain insights and allow the researchers to develop ideas on how to effectively integrate physical therapists into the disaster response efforts of Biñan, inspired by the study by Chua et al. (2022)—which used a similar research design that resulted in reliable results. The FGD determined the physical therapists' experiences, perceived capabilities, and perceived roles in disaster management. It also helped the researchers gather necessary information from the CDRRMO members of Biñan regarding their existing disaster framework and gauge their knowledge about physical therapy and their perceptions of integrating it into disaster risk response efforts.

Source of Data

The study used two sources—primary and secondary. The primary data came from the FGD, which provided the qualitative data required for thematic analysis. The researchers used the insights from the FGD to develop a disaster response framework integrating physical therapy into the disaster response efforts of Biñan. Secondary sources included local and foreign studies, journals, articles, and literature that were carefully reviewed and cited using online databases.

Population of the study

The population consisted of ten (10) participants—five (5) physical therapists and five (5) personnel from the CDRRMO of Biñan. The study employed a non-probability sampling technique, specifically purposive sampling, where participants were selected based on their knowledge, experience, and profession. The researchers selected five licensed physical therapists practicing in Biñan to explore their disaster-related experiences and perceived roles. Five members from the CDRRMO were also chosen to assess their current framework and the potential for integrating physical therapists.

The researchers will select the study's respondents based on inclusion and exclusion criteria. The inclusion criteria for the population were the following: (i) licensed Physical Therapist—either male or female, (ii) physical therapists that operate within Biñan, (iii) professionals with specialized knowledge or expertise in disaster management, (iv) CDRRMO council members of Biñan, and (v) participants who are proficient in Filipino or English. The exclusion criteria were the following: (i) unlicensed physical therapists, (ii) physical therapists or disaster responders who have no prior experience in disaster scenarios or crisis management, (iii) individuals unwilling or unable to participate in interviews or surveys due to time constraints or other personal reasons (e.g., PTSD), and (iv) participants who are not proficient in Filipino or English.

Instrumentation and Validation

The researchers used an FGD discussion guide developed from the “Guidelines for Conducting a Focus Group” by Eliot & Associates (2005, University of Mississippi). A senior physical therapist and an expert in qualitative research validated the instrument. The guide included 12 prompts divided into three parts: engagement questions, exploration questions, and exit questions.

Evaluation and Scoring

The FGD recordings were transcribed to ensure accuracy, including capturing non-verbal cues. Transcripts were reviewed and corrected by cross-referencing the recordings. The researchers documented initial impressions and key observations during transcription. The data were then analyzed by repeatedly reading the transcript, identifying meaningful statements, and applying initial codes manually. Codes were grouped into potential themes, which were reviewed and refined. Each theme was defined and described, followed by the construction of a coherent narrative using participant quotes. Finally, the findings were linked to the research objectives to generate actionable insights and conclusions.

Data Gathering Procedure

Pre-implementation

The researchers first obtained approval from the college department. Permission was then secured from the Dean of the College of Physical Therapy and the research adviser. Upon approval, participants were selected purposively based on inclusion criteria. Consent letters were distributed to the selected respondents. The signed letters confirmed their agreement to participate and outlined the research procedure in detail. Data gathering proceeded once all consent forms were collected.

Implementation

Each participant received a copy of the discussion guide 10 days before the online FGD to allow time for preparation. The researchers then administered, recorded, and transcribed the online FGD.

Post-implementation

After collecting responses, the researchers compiled and treated the data. They then analyzed the results and formulated a guideline—based on the following: Republic Act No. 10121 (2010) provided the legal framework for disaster risk reduction and management in the Philippines. The Sphere Handbook (Sphere Association, 2018) offered global standards for humanitarian response, including health and rehabilitation. The Sendai Framework for Disaster Risk Reduction 2015–2030 (United Nations Office for Disaster Risk Reduction [UNDRR], 2015) highlighted the importance of strengthening health systems and reducing disaster-related disability. The World Health Organization's (WHO) Emergency Medical Teams: Minimum Technical Standards and Recommendations for Rehabilitation (WHO, 2017) provided guidance on integrating rehabilitation into emergency response. WHO's Mental Health and Psychosocial Support (MHPSS) Guidelines in Emergency Settings (WHO, 2013) and Health Emergency and Disaster Risk Management Framework (Health EDRM) (WHO, 2019) emphasized emotional well-being and preparedness in crisis contexts. The Guidelines for Conducting a Focus Group by Eliot and Associates (2005) were used to develop and validate the interview tool. Additionally, evidence supporting body-based psychosocial interventions in low-resource communities was drawn from Cherewick et al. (2023), which highlighted their effectiveness in post-disaster mental health care. on integrating physical therapists into Biñan's disaster response strategy.

Statistical Treatment of Data

Thematic analysis was used to analyze the data. This approach helped contextualize experiences and understand participant perspectives (Voxco, 2021). The six steps followed were: (i) familiarization, (ii) coding, (iii) generating themes, (iv) reviewing themes, (v) defining themes, and (vi) writing.

Wherein:

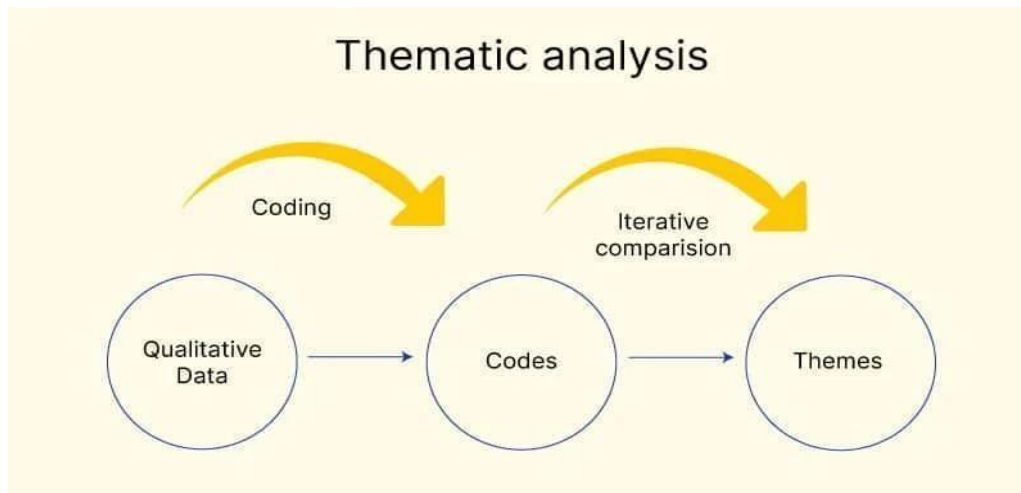


Figure 3. Thematic Analysis Diagram

RESULTS AND DISCUSSION

The following emerging themes are as follows:

1. Physical Therapists' Role in Disaster Response

When asked what specific roles they believe physical therapists should play in the disaster response efforts in Biñan. The shared insights of the participants showed a noteworthy understanding of a physical therapist's capabilities and possible role during disaster response. Other stakeholders also agreed that a physical therapist's mastery of human anatomy makes them valuable in disaster response.

"Like yung uhm kunware yung mga wounds and fractures. So ayun marunong kayo mag identify ng mga yun. And then kaya siyang i-manage acutely." - PT 1

"...alam kasi ng physical therapist kung saan yung, meron silang anatomy, sanay kayo kung saan yung dapat hawakan, mabalik yung abnormalities ng limb or extremities ng tao, ng biktima." - NDRMC 3

Klappa and colleagues (2013), as cited by Chua and Obra (2022), concluded that physical therapists are valuable in disaster response because of their ability to provide triage skills, clinical care, patient and family care education, and community outreach. The role of physical therapists in disaster response is not limited to rehabilitation alone—they can also offer a comprehensive, holistic approach that includes first aid, triage, wound care, fracture management, and patient assessment—making them a valuable frontline responder.

"So ayun, more of sa assessment tayo na site kung sino ang dapat i-rescue muna, kung sino yung kaya pang mag antay ng onti. So ayun magaling ang PT pagdating sa assessment, sa pag-assess. So mas trained tayo mag assess kaysa sa ibang healthcare professionals." - PT 5

"kunware kulang yung mga mag-wound care, kulang yung mga kasama triage. So yung organization ng PTs can help in times of disaster kapag ganyan. So kunware kailangan nila ng tulong, the organization ng PTs na nasa biñan can help as an organization" - PT 1

As movement experts, they play a pivotal role in restoring physical function and minimizing disability. Furthermore, their leadership capabilities and adaptability allow them to take initiative, coordinate with other professionals, and support interdisciplinary teams, especially in chaotic or resource-limited environments. Additionally, WCPT (2016), as cited by Chua and Obra (2022), states that physical therapists form a required link between hospital and community health services, and may have strong multidisciplinary links across social care, education, and community services.

"A PT's role is to prevent long-term disabilities, not only that, mapipigilan rin yung exacerbation ng ibang mga comorbidities." - PT 3

"Para siguro yung pinaka-unique na mau-offer ng isang PT pagdating sa community, lalo na sa disaster response, mag-stick tayo sa definition kung ano talaga yung ginagawa ng PT. We are movement experts." - PT 2

"alam natin kung paano may function yung body part na yun, may specific body part na yun. So human function and movement expert. So siguro yun talaga yung may-offer natin pagdating sa disaster response" - PT 4

"saan makakatulong ang PT? Just knowing what to do, tapos yung leadership skills ng pagiging PT can be a key on keeping others safe." - PT 5

Recognizing and formally integrating their contributions into disaster planning and response frameworks is essential for maximizing emergency healthcare outcomes.

"Anyway, so I firmly believe na kailangan talaga nating ng mga PT para sila makapag-participate during crisis or during disaster." - PT 3

2. Physical Therapists as a Vital Extension of Medical Teams in Disaster Management

Based on the shared views of the participants of the study, physical therapists could partake in disaster management as a vital extension of the medical team, serving as an additional workforce. This perception could be because entry-level physical therapists can already provide services that resemble the tasks performed during disaster management (Chua & Obra, 2022).

"Nandiyan kayo, ay mas maraming tayong manpower. Maraming tao yun. Maraming na disgrasya. Mas maraming tayo, mas maganda." - NDDRMC 4

"Basic role ng PT would be more of uhm to augment yung manpower, lalo na kung ang concern is regarding health." - PT 1

"Since mayroon kayong knowledge, mayroon kayong kaalaman sa pag-bandage, same as with the EMS responder, siguro additional manpower, yun yung maging role, additional manpower" - PT 1

Physical therapists specialize in rehabilitation, injury assessment, and functional recovery, making them invaluable in managing the surge of injured survivors during disasters. Furthermore, physicians recognize physical therapists' roles in clinical and research settings, believing they can treat different patients (Rueda et al., 2022).

"...you need to be good judges, and you have to have those basic skills, lalo na kapag merong disaster." - PT 1

"Marunong kayong mag assess ng patient. Pangalawa, alam niyo kung anong dapat gawin. Alam niyo ano limits niyo as a PT, alam niyo yung knowledge niyo as a PT." - PT 1

Physical therapists can enhance disaster response efforts' overall capacity, efficiency, and effectiveness by contributing physical assistance and theoretical knowledge.

"Kunware kulang yung mga mag-wound care, kulang yung mga kasama sa triage. So yung organization ng PTs can help in times of disaster kapag ganyan. So kunware kailangan nila ng tulong, the organization ng PTs na nasa biñan can help as an organization" - PT 1

The repeated reiteration of "additional manpower" showcases the role of physical therapists in reinforcing overwhelmed disaster responders and healthcare professionals.

3. Multifaceted Role of Physical Therapists in Disaster Management and Recovery

When asked how to effectively integrate physical therapy into interdisciplinary teams during disaster response, the participants' responses highlighted the multifacetedness of physical therapists in the disaster community. According to Chua and Obra (2022), entry-level physical therapists are capable and knowledgeable in providing various services, including clinical care, triage, and rehabilitation, further emphasizing the multifaceted nature of physical therapists.

"Physical therapist, siguro, pwede sila sa response, pwede rin sila sa recovery" - NDRRC 1

"Injured, so halimbawa balik o dislocation ng mga extremities, malaking impact niyo doon kasi kayo yung alam kung ano dapat exercise or technique para maibalik sa dati niyang normal na galaw yung kanyang extremities injured, so halimbawa balik o dislocation ng mga extremities, malaking impact nyo doon kasi kayo yung alam kung ano dapat exercise or technique para maibalik sa dati niyang normal na galaw yung kanyang extremities." - NDRRC 3

"Merong mai-ooffèr ang PT, lalo na yung knowledge natin about anatomy, about physiology. So kunware alam mo naman na may fracture, so yung fracture tapos nag b-bleed. So alam mo yung mga consequences ng fracture" - PT 1

"Kasi ang PT para talaga siyang jack of all trades. For lack of a better term. Parang ganun talaga siya" - PT 2

Physical therapy can contribute across all phases of disaster management—from preparedness to recovery. Their extensive expertise in anatomy, injury assessment, rehabilitation, and patient management allows physical therapists to address various ailments, such as wound management, patient education, mobility restoration, prevention of disability exacerbation, and psychological stress management through exercise-based interventions.

"Pre-disaster, So PT, ang ginagawa nila is to educate. To educate the, let's say yung mga tao sa barangay. By conducting seminars" - PT 2

"So ayun, more of sa assessment tayo sa site kung sino ang dapat i-rescue muna, kung sino yung kaya pang mag antay ng onti. So ayun magaling ang PT pagdating sa assessment, sa pag a-assess. So mas trained tayo mag assess kaysa sa ibang healthcare professionals." - PT 1

"So let's say pag sa pre-disaster proper transfer technique, proper lifting, yung mga ganoon. Pag sa post-disaster naman siyempre tuturuan natin yung mga individuals na affected. Like nahihirapan siya mag-ambulate so tutulungan natin siya makarating from point A to point B. So ganoon yung nakikita ko magiging unique role ng PT na hindi siya kayang i-compare sa lahat." - PT 2

"...makakatulong rin ang mga PT sa recovery ng mga survivor kasi again may injuries, so kung may injuries may recovery, kaya makakatulong rin sa pagiging mobility and function." - PT 3

Physical therapists should also play a role in disaster planning and interdisciplinary collaboration. Physiotherapists play a crucial role in disaster management by aiding the physical rehabilitation and functional recovery of affected individuals. Their involvement ensures early mobilization, pain management, and prevention of long-term disabilities, particularly for those injured during disasters such as earthquakes, floods, or conflicts (Sethi et al., 2024).

"Pwede kayong nandito, kasama kayo sa pagpapalano. Pwede rin kayo dun sa response" - NDRRMC 4

"... in order for the PT na makapag-collaborate ng maayos, it's important na kasama sila sa plano all throughout" - PT 3

"So yung iba't ibang profession working together to collaborate. I think yung sa PT, mas mag-work siya kung interdisciplinary approach" - PT 3

Physical therapists with proper and extensive training can provide streamlined triage processes and improve outcomes through timely assessment and holistic care.

"Yung galing ng PT na mag-assess, it will help a lot...makakakonserve ng time" - PT 3

"...since PT, we cannot prescribe drugs, but we can manage them through exercise, and exercise kasi is one of the best na pang laban sa psychological distress, such as depression and anxiety..." - PT 1

Their integration into disaster response teams enhances healthcare delivery's effectiveness and efficiency in disaster scenarios.

"...I firmly believe na kailangan talaga natin ng mga PT para sila makapag-participate during crisis or during disaster." - PT 2

4. Gaps in Medical Knowledge and Procedural Training

When prompted to cite challenges or barriers encountered when integrating physical therapists into disaster response teams, the participants, both among physical therapists and other stakeholders, mentioned the notable gaps in their knowledge. According to Bektaş Sarı and Yunus Emre Özer (2023), issues in disaster management include a shortage of trained personnel, disorganized resource management, and inadequate human resources. Physical therapists face gaps regarding disaster management training, while NDRRMC officers face gaps concerning limited medical knowledge, which is crucial to disaster response.

"Kasi kami hindi naman lahat sa amin may background sa medical, sa medicine." - NDRRMC 1

"Kasi nga, as a rescuer, limited lang rin naman yung knowledge namin." - NDRRMC 3

"...I think parang hilaw pa for lack of a better term. Hindi pa ako ganoon confident pagdating sa disaster management sa community." - PT 2

This limited medical background highlights the need to integrate physical therapists into the emergency response team as additional professionals with the capability and skillset to manage specific conditions.

"pag meron kaming mga nai-encounter na may mga physical condition nga tulad yan. Especially yung mga may edad na, tapos yung mga stroke patient. Di ba, may tawag nyo rin ng proper management." - NDRRMC 3

"So kami ang alam namin, basta be careful lang sa pagbubuhat. Yan naman talaga yun. Kaya lang ang limited sa amin, hindi namin alam yung more than that ba. Na baka akala namin,

enough na yung gamit, wala naming pag-iingat. Kulang pa pala. Kasi meron syang inihinda pa"
- NDRRMC 4

"Ngayon, paano natin sila aalisin doon sa lugar nila, na hindi nadadagdagan injury nila. Sabi ko nga sa inyo, sa part namin to, hindi namin talaga yan naiintindihan." - NDRRMC 3

In contrast, physical therapists' limited training and experience in disaster management hinders their ability to fully integrate into the team, which requires efficiency and effectiveness in high-pressure, resource-limited conditions. In addition, implementing disaster plans while dealing with multiple authorities poses challenges, such as a lack of clarity and leadership issues in operational disaster management (Bektaş Sarı & Yunus Emre Özer, 2023).

"So sanay tayo yung slowly, progressive—yung mga ganun. So slowly but surely, kaya nga ang PT kasi, ang notion dyan is pumapasok lang pagkatapos ng aksyon" - PT 1

These gaps can hinder a physical therapist's effectiveness in disaster scenarios, where interdisciplinary flexibility is often required. Addressing these knowledge gaps through specialized training and seminars is essential to maximize the overall contribution of physical therapists in disaster management.

5. Resource Deficiencies in Disaster Management

Limited resources, such as insufficient medical supplies, infrastructure, tools, and support from organizations and government agencies, seriously hinder disaster management. According to Chua and Obra (2022), the minimal involvement of physical therapists in disaster management stems from time and financial constraints caused by the lack of affordable and accessible resources for disaster management training.

"Pagdating kasi sa resources, medyo nangilangan ng marami." - NDRRMC 2

"Wala tayong masyadong gamit. So, we have to learn how to work on very limited equip, resources, yung mga equipment na wala sa mga community centers." - PT 3

"Pag ganyan so minsan nagkukulang talaga ng gamit since in times of disaster marami yung naiinjury, dumarami yung mga casualties." - PT 1

These limitations compromise response effectiveness and contribute to high casualty rates. The lack of preparedness, such as difficulty in early detection of earthquakes, further reveals systemic weakness. Additionally, the lack of governmental and organizational support further exacerbates the issue. Organizational support is a pivotal determinant in the participation of physical therapists in disaster management. Non-government organizations (NGOs) and professional associations facilitate the engagement of physical therapists, making them instrumental in emphasizing the necessity of partnership and resource allocation (Tan, 2023).

"...kasi di natin alam kung kelan mangyayari [earthquake], wala tayong tool, walang device, na makapagsabi na mangyayari yan kung saan, kailan. unlike sa flood, alam natin kung kailan tatama yung bagyo." - NDRRMC 5

"...support from PPTA actually. yung funding, inadequate funding. Alam niyo naman dito sa Pilipinas ang hirap talaga ng funds. Bukod na yung problem sa funds sa PT, bukod pa yung problems sa funds pagdating sa community, bukod pa yung sa government. So ang dami talaga inadequacies." - PT 2

During these scenarios, the ability of healthcare professionals, including physical therapists, to remain flexible and adaptive is crucial to sustaining care and minimizing harm.

6. Bridging Medical Knowledge and Practical Field Experience

Effective disaster management requires physical therapists and the NDRRMC to bridge the gap between theoretical medical knowledge and practical field experience. Additionally, physical therapists' experiences in community service, special populations advocacy, and administrative management provide them an ideal platform for performing non-clinical functions (Chua & Obra, 2022).

"...kayo yung nandiyan sa ano, as medical practitioner, mas alam nyo yung nangyari. So iba kasi yung nangyari sa actual, sa field." - NDRRMC 1

Physical therapists must be able to apply their theoretical foundation to actual disaster scenarios, which often starkly differ from clinical settings—requiring the ability to adapt clinical skills into field application, manage patients under pressure, and make informed decisions in unpredictable situations.

"So it's very important to know kung ano yung mga dapat gawin. Mga first line of defense..." - PT 2

"Yes, dapat maincorporate siya sa PT education. Kasi hindi naman kaya ng mga rescuers lang na sila lang." - PT 1

"I think ano din yung ano pinaka-importante is yung acute injury management kasi although meron kaming lesson about first aids and bandage and yung mga wound dressing, it's important na although maganda yung theoretical natin as PT, mas maganda na may exposure tayo. For example, sa internship or yung meron tayong subject sa disaster" - PT 3

Furthermore, integrating physical therapists in disaster management greatly helps disaster responders make informed medical decisions during rescue, which leads to lower chances of aggravating existing injuries.

"Kapag yan, konting galawin mo lang dyan, possible na ito mangyayari dyan. So doon pala, na ano na kami ngayon. Kasi kung ginalaw pala namin ito, edi nakasuhan pa kami." - NDRRMC 3

The statements from the respondents accentuate the importance of applying theoretical knowledge in a real-world context as essential for competent disaster response, specifically during resource constraints.

7. Strengthening Disaster Management Through Interdisciplinary Collaboration

When questioned how to strengthen communication and collaboration between physical therapists and other team members during disaster response, the participants noted that strengthening disaster management requires a robust interdisciplinary collaboration, fully integrating physical therapists into a unified response framework with other healthcare professionals.

"Kasi yung Disaster, hindi mo lang siya pwedeng sabihin na pang disaster lang talaga siya. Actually, lahat sakop namin eh" - NDRRMC 2

"So first, as PTs we need to organize. Para merong coordination between sa responders at sa organization natin ng sa PT. Kasi doon magsisimula kapag nag-organize tayo, alam nila kung sino i-approach tapos parang wholesale yan. So as a group makilala tayo as disaster responders. So if that's the case, willing naman tayong gumawa ng organization." - PT 1

"iba't-ibang profession, iba't-ibang skill pagsasamahin as one team." - PT 1

"mas maganda, Mas magiging productive, tingin ko. Mas magiging mabilis yung response." - NDRRMC 4

Physical therapists are proficient at multidisciplinary collaboration, allowing seamless integration within disaster management teams (Chua & Obra, 2022). Effective coordination between various sectors enhances efficiency, lessens confusion, and ensures a comprehensive plan of action and care during disasters.

"...policy-wise, I think pag disaster management, so siguro yung policy is to activate all allied health professionals" - PT 1

"So dapat from the very start na doon yung PT sa meetings para malaman yung role assignments nila. And then kapag nalaman nila yung role assignments, mababawasan yung confusion and magiging efficient yung galaw" - PT 3

The integration of physical therapists in planning and response processes, reinforced with clear roles and proper documentation, maximizes their contribution and utilizes their skills.

"it's important to have a clear role assignment para kapag sa mga may disaster, alam na nila kung anong gagawin, alam na nila kung saan sila magfocus. But at the same time, yung role sila, they complement others. And another thing, I think sa documentation din. So kailangan yung documentation natin is standardized para maintindihan not only ng PTs or other health professions pero para maintindihan rin ng other responders kahit na hindi sila nasa medical field." - PT 3

"So if you want to be a part of disaster management, kailangan part ka ng isang group na talagang nag-respond in times of disasters or emergencies" - PT 1

Collaborative efforts across multiple disciplines improve outcomes and advance the impact of the physical therapy community within disaster management.

8. Challenges of PT Integration in Disaster Response

When asked about specific gaps or limitations in existing policies that affect the involvement of physical therapists in disaster response, the participants shared several challenges when integrating physical therapists into disaster response, including limited training, lack of disaster experience, vague role definitions, and inadequate dissemination of relevant policies and protocols.

"Sa biñan, hindi kasi ako familiar since hindi siya ano, isa din sa problem is hindi siya nadedisseminate sa lahat. Hindi siya properly disseminated so hindi ako familiar sa policies and protocols na meron sa biñan." - PT 1

"I mean personally, hindi ko talaga siya na-apply as of now. I think ang maganda din dyan would be to allot time para himayin kung ano man yung frameworks and isa puso para maroon tayo ng familiarity talaga pagdating sa mga ganyan." - PT 2

Many physical therapists possess minimal exposure to disaster scenarios due to a lack of training and experience (Chua & Obra, 2022). Furthermore, physical therapists are not formally established in emergencies, leading to underrecognition and underutilization.

"Lagi kasi silang mag-tie up sa city health, city health office, non-governmental organization. So mas maganda ilapit pa natin yung mga PT sa community." - PT 4

Furthermore, systemic issues such as undefined scopes of procedure and the lack of policy-level recognition exacerbate the challenge.

"So as long as may panganib, kahit nasa evacuation center, response pa rin 'yun. Hindi porke nasa evacuation center na, recovery na agad." - NDRRMC 4

"Kasi although currently kahit na ang organization namin ay in partnership with the PDAO or the Persons with Disabilities Affairs Office, so far hindi pa kami na dideploy sa disaster response." - PT 3

"Kasi pagdating dito talaga sa Philippines, bukod na yung problem natin sa disaster, bukod na yung problem natin sa image ng PT as master of none, bukod pa yung problem pagdating sa PT law. Restricted lahat pagdating dito sa practice ng PT." - PT 2

Institutionalizing the role of physical therapists within disaster management systems is crucial to overcome barriers and establish clear guidelines and policies. Recognizing the role of physical therapists in the disaster management framework stresses the importance of endorsing the inclusion of physical therapists in resource planning and coordination. Properly recognizing their role can lead to enhanced preparedness and resource allocation, essentially improving disaster management effectiveness (Tan, 2023).

"...yun yung isa parang isa sa magiging challenges kung ipapasok tayo sa disaster response. Pero yung challenge naman na yun is na-ttrain naman. Lahat ng tao kaya yun, kahit nga hindi nga nakapagaral ng PT kaya niya magtrain sa mga ganung situations." - PT 1

"Kasi kumbaga I think it's high time na para ma-establish talaga yung role ng PT sa community pagdating sa disaster management." - PT 2

The data reflect a growing call to formally establish and institutionalize the PT role within multidisciplinary disaster response teams to ensure their contributions are recognized and utilized.

9. Leveraging PT Expertise to Maximize the Impact of PTs in Disaster Management

When questioned about the unique contributions physical therapists can bring to a multidisciplinary disaster response team, the physical therapists participants shared the value of their clinical expertise, which significantly enhances disaster response and patient recovery.

"I believe na magiging important yung PT role kasi sa disaster maraming injuries siya and then may mga taong aside from injuries, siyempre kailangan may ililikas na people with disabilities especially mga nasa low-lying areas, mga nastroke and siyempre another risk ng mga nasa low-lying is mostly nandoon yung mga may cerebral palsy." - PT 3

"When it comes to disaster, parte rin ng job natin ng PT, yung mga wound dressing, patient education, saka yung mga sa acute care and long term aspects." - PT 1

"Unlike sa clinical setting kapag ito may disaster, mostly mga acute injuries to tapos mga low resource environment. So kailangan makapag-adapt ka tapos makagawa ka ng paraan para matreat sila ng onting resources." - PT 2

According to Tan (2023), physical therapists demonstrate remarkable efficacy when leveraging their existing skills and clinical proficiencies within a disaster context. Their injury assessment, wound care, and patient management skills make them a key player in delivering timely and effective care.

"So yung knowledge talaga yung pwede natin ma...yun talaga advantage natin pagdating sa disaster response. So pwede natin madiskartehan yun based on knowledge, based sa knowledge natin." - PT 1

"...tsaka lalo-lalo na yung after kapag rehabilitation. So marunong tayo mag-identify na yung iba't-ibang klase ng wounds" - PT 1

The physical therapy participants were willing to engage in organized disaster response efforts. Despite the lack of formal training in disaster management, many physical therapists believe they

can provide rehabilitation services during disasters, implying a willingness to partake in disaster activities. The willingness of physical therapists emphasizes that they should be providing their services throughout the phases of disaster management (Chua & Obra, 2022).

"...if ma-include ang PT, it would mean that our expertise will be put to use." - PT 1

When their roles are clearly defined and integrated, physical therapists are well-suited to contribute to disaster response meaningfully.

10. Policy Limitations and the Need for Enhanced Integration of PTs

When asked about specific gaps or limitations in existing policies that affect the involvement of physical therapists in disaster response, the participants shared their sentiments regarding policy limitations that restrict the involvement of physical therapists in disaster management and primary care.

"...ang naka-stipulate doon sa Republic Act 5680 is gagalaw ang PT under, hindi lang supervision, basta may referral from the doctor. And I think that's very limiting." - PT 2

"I think dapat mag training ang PT for BLS [basic life support]. May certification kasi ang BLS so dapat lahat ng PTs ay BLS certified." - PT 1

"PT bill. Yung nasa tertiary na ngayon pero hindi pa na-approve. So I think pag na-approve yun into law, magiging PT law siya. So mas meron ng freedom yung PT to practice." - PT 2

Current policies often fail to define physical therapy roles, highlighting the differences in international policies and the need for changes that better define and support the role of physical therapists. RA 5680 established the Board of Examiners for Physical Therapists and Occupational Therapists and set the standards for licensure, regulation, and ethical practice of these professions. However, it does not specifically mention the role of physical therapists in disaster risk reduction and management (DRRM).

"Lalo na dito sa mga Filipino physical therapists. Walang problema pag sa US setting. Kaya nila mag-act independently yung mga PT." - PT 2

"sa US wala nang barrier ang PT and part ng primary care ang PT" - PT 1

Enhancing collaboration and communication across disciplines requires an established framework, standardized documentation, and revision of existing training programs that reflect the realities of disaster response. In recent years, there has been a growing recognition of the importance of integrating physical therapists into DRRM initiatives. For instance, a study by Chua and Obra (2022) developed a framework outlining the priority actions of Filipino physical therapists in disaster management, emphasizing their roles in mitigation, preparedness, response, and recovery phases.

"...isasama mo siya sa curriculum and further training lalo na sa disaster management kasi yun nga, ang sabi ko nga, hindi siya routine sa atin na ginagawa." - PT 1

"para kumbaga ma enhance natin yung ahh.. communication and collaboration no, so kailangan may sinusunod tayong framework." - PT 2

"So importante talaga na magkaroon ng pagbago pagdating sa joint training program. So kailangan magkaroon ng mas malakas na training program for that and also kailangan maging mas effective yung campaign drive or information sharing." - PT 3

Strengthening these deficiencies will further promote physical therapists' integration and impact on disaster management—helping align physical therapists' roles with broader healthcare goals and facilitating a more effective disaster response.

11. Strengthening PT Preparedness Through Disaster Management Training

When asked what key components to include in the development of standardized guidelines and policies for the role of physical therapists in disaster response, the participant shared the belief that to contribute in disaster settings effectively, physical therapists require targeted training in emergency response, encompassing Basic Life Support (BLS) training, wound care, and disaster management to be more in depth into the physical therapy curriculum.

"...importante yung training especially sa mga PT kasi based doon sa knowledge ko and yung mga natutunan ko nun sa DPT, sa discussion, more of yung PT mas nagpo-function siya pagdating sa pre-disaster, yung before disaster, and post-disaster or yung after disaster." - PT 2

"So kailangan talaga natin more learning pagdating sa mga ganyan. So kailangan more trainings" - PT 1

The current gaps in the educational preparation limit a physical therapist's readiness and confidence to respond to crises. Situations requiring tasks and training beyond the scope of physical therapy practice, albeit adaptable and versatile, underscore the need for standardized training and guidelines aligned with the unique demands of disaster settings (Tan, 2023).

"...kasi kumbaga hindi mo na saklaw yun eh. So kailangan mo pa ng training, kailangan rigorous training, certifications para talaga maging confident ka para mag-assume ng role pagdating sa disaster management." - NDRRMC 1

"Kasi ang knowledge ko lang ay napag-aralan ko. So the PT is pre and post. Pag during kasi ang magiging role ng PT diyan pwede sila magrespond sa disaster but kailangan meron silang proper training." - PT 2

Additionally, training opportunities such as seminars, workshops, and field training are crucial to build the competencies needed for disaster response.

"So ayun maiintegrate siya through number 1, if we can have seminars and workshops lalo na kapag disaster response. So I think kaya naman siya kasi high school nga, no high school kami we would have those seminars and workshops." - PT 1

Strengthening physical therapy education focusing on disaster preparedness will guarantee that physical therapists are knowledgeable and equipped with the skills to serve as effective responders. Additionally, collaboration between physical therapists and other health-allied professionals can mitigate task disparities, ultimately fostering holistic patient care (Tan, 2023).

12. Cultural Factors in Disaster Management

When asked to give an example of a community-specific need and how policy could address it, one participant highlighted the significant influence of cultural and socioeconomic factors, specifically Filipino Culture, on disaster preparedness and response.

"Kasi, it goes hand in hand. Yung culture at pagdating sa disaster preparedness." - PT 2

Issues such as discipline, risk perception, and community behavior impact the effectiveness of disaster management and contribute to higher casualty rates. Furthermore, Filipinos have a cultural habit called the "Mañana habit." It is often seen in disaster preparedness, where people

delay making emergency plans or preparations until it is too late. It is a barrier to proactive behavior, especially in time-sensitive situations like disaster risk reduction.

"...kahit anong gawin mong training dyan pagdating sa disaster, economic pa rin yung thinking nila na bahala na. wala rin mangyayari." - PT 2

"Nandun yung, hindi ko matandaan yung proper term, mañana habit ba? Yung puro mamayana, bahala na." - PT 2

Filipinos tend to have a strong attitude when prioritizing their properties, belongings, and assets over safety. Years of hard work make it difficult to leave all their belongings during a disaster, causing the number of people injured or dying in calamities to rise (Gumasing & Sobrevilla, 2023). Comparisons with another country suggest that cultural differences shape disaster response behaviors, highlighting the need to address the unique challenges Filipino culture presents through community education.

"Tingnan nyo naman sa Japan, if you compare sa Japan, disciplined sila." - PT 2

"I think yung sa culture natin, mahirap talagang i-apply yung mga ganyang programs kasi hindi nagmamatch sa culture natin. More of protective of belongings since yung bansa natin hindi ganoon kayaman, hindi naman first world country ang Philippines. So syempre yung i-woworry mo is yung sa mga properties mo. Parang ganoon." - PT 2

"...kasi matitigas ang ulo ng mga Pinoy, sa totoo lang kung real talk lang tayo, matitigas ang ulo ng mga Pinoy. And hindi naman natin masisisave ang karamihan kasi ganoon na sila namulat sa sistema, ganoon na yung kultura sa Pilipinas." - PT 2

Addressing these challenges demands culturally sensitive education, community engagement, and policy approaches that regard the local context to enhance disaster outcomes.

"...siguro turuan na rin ng disiplina yung mga tao. Turuan ng disiplina and i-correct yung mga nakikita na nating mali or yung mga na-identify nating mali pagdating sa kultura natin or yung sa way of living natin." - PT 2

"aside from pushing for a better disaster awareness program, dapat sinasabay na din yung pag-correct dun sa way of living ng mga Pinoy. Para mas mag-i-effective talaga yung program." - PT 2

Cultural and socioeconomic factors significantly influence disaster response in the Philippines. Addressing these through culturally sensitive education and community engagement is essential to improving preparedness and reducing casualties.

CONCLUSIONS

Integrating physical therapists into disaster management is necessary to optimize emergency and disaster response efforts. Despite the existent challenges, such as unclear role definitions of physical therapists, insufficient training, lack of resources, and a lack of awareness among local disaster management offices—physical therapists have shown great enthusiasm and willingness to partake and contribute to disaster response initiatives. In addition, the recognition by the National Disaster Risk Reduction and Management Council (NDRRMC) emphasizes the potential enhancement of disaster response strategies that integrate the expertise of physical therapists. The Integration Framework of Physical Therapists in Disaster Management and the Physical Therapists in Disaster Response: Action Priority Framework were developed to provide structured guidelines on integrating physical therapists into local disaster initiatives and strategies that also illustrate how physical therapists can contribute and incorporate their knowledge in the NDRRMC initiatives in disaster management. These frameworks aim to

inform disaster management offices, such as the National Disaster Risk Reduction and Management Council (NDRRMC) of Biñan, of the essential role of physical therapists in disaster response while promoting inclusive policies that integrate physical therapists as additional trained human resources. Furthermore—by integrating physical therapy into disaster management, the emergency response teams can further strengthen their capabilities in aiding the health concerns and rehabilitation needs of susceptible populations which contributes to an overall comprehensive and efficient disaster response system.

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