

The Resilience of Primary Healthcare Professionals: A Systematic Review Across Various Medical Specialties: Physiotherapist, nurse, and radiologist in emergencies

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Abstract

Resilience is a critical attribute for primary healthcare professionals, particularly physiotherapists, nurses, and radiologists, who work under high-stress conditions in emergency settings. This systematic review examines resilience in these three medical specialties, focusing on their unique challenges and strategies to cope with occupational stress. The review highlights key resilience factors, such as psychological well-being, adaptability, and teamwork, and underscores the significance of training and support systems in enhancing these professionals' ability to manage stress effectively. Challenges, including rapid decision-making, communication barriers, role ambiguity, and emotional labor, are addressed. Strategies for resilience-building, including training programs, mentorship, and organizational interventions, are explored. The study emphasizes the need for tailored resilience-enhancing strategies and policies that address systemic workplace issues to sustain healthcare delivery and improve patient outcomes. Future research should focus on evidence-based interventions and policies that foster resilience in healthcare professionals across various specialties and work environments.

Keywords: Resilience, Primary Healthcare Professionals, Emergency Care, Physiotherapists, Nurses, Radiologists, Occupational Stress, Training Programs, Organizational Interventions, Healthcare Challenges.

1. Introduction

Resilience in primary healthcare professionals is essential for maintaining healthcare provision during crises. High workloads and chronic stress are well documented in this sector. However, not much is known about emergency preparedness or the professionals who work in this area. What is their vision of the emergencies in which they participate? What is their job preparation and training? Moreover, although stress and lack of preparation are also mentioned in other medical emergencies, little is known about professionals' training and their vision of primary care emergencies. (Karreinen et al.2023)(Stengel et al.2022)(Litke et al.2022)

Comprehension of resilience factors could allow managers to improve trauma teams by promoting the acquisition of these skills. To achieve such understanding, healthcare provider resilience must first be comprehensively explored. This will allow a better understanding of the preventable factors and potential improvements to the training of health professionals that would allow them to improve, anticipate risks and possible failures, and train them to minimize the impact of stress during their work. Consequently, it is not clear whether emotional impact influences process-of-care management during crises. Further, factors influencing resilience among emergency professionals may not be the same across their specialties. Therefore, we aim to describe the resilience of primary care professionals who work in other medical specialties aiding in the provision of emergency care in their health centers and to know whether this dedicated training for emergencies differs from primary healthcare professionals. We therefore aim to ascertain the degree of resilience among the different professionals in relation to working in different areas. We also wish to consult the conditions of healthcare facilities into which the professionals will have relocated. (Heydari et al.2022)(Wong et al.2022)(Iflaifel et al., 2020)(Owen et al.2023)(Jyothindran et al.2020)(Geuzinge et al.2020)(Munn et al.2022)(van et al.2020)

Resilience was mentioned in preventing the physical and emotional repercussions of chronic stress. It was necessary to define its dimensions and attempt to improve resilience in professionals as a result. Before we finally decided to perform the review, we made two separate attempts to assess the importance of resilience in all of the aforementioned domains. The intention was to draw up collections of agreed items. However, these attempts did not provide any specific recommendations about resilience in domains other than emergency medicine. Finally, we noted the importance of training professionals for the emotional hazards they might face in their job so that they may continue to provide good care. The reports actually stated that teams might be more resilient and that they might be prepared to cope with complex and extreme situations. Therefore, we need to develop training courses that help us prepare in advance for the collapse of coping skills. It is expected that experts will be asked to be experts in crisis coping based on the development of three lines. In order to model susceptibility to development by treating reference lists, we reasoned that there might be workforce species that were both resilient and fragile. (Preis et al., 2020)(Denckla et al.2020)(Manchia et al.2022)(Lorente et al., 2021)(Urcos et al.2020)(Bahar et al.2020)

1.1. Background and Rationale

Psychological resilience is the process of facing challenges and adversities, including acute and chronic stress. This includes qualities such as hardiness, optimism, coherence, resourcefulness, commitment, and the ability to learn from positive and negative experiences. Resilience within healthcare has been shown to surpass the concept of psychological capital. The ability to be kinder and have an attitude favoring self-control over time raises subdermally. Furthermore, the way primary care professionals working in emergency departments apply pressure in relation to their work, and the ability to lead in as many health domains as possible, including resilience components such as internal influences, breathing, and self-control, is important for mental and emotional well-being. In addition, the loss of perfect judgment when under pressure and the increased safety of the affected person must be considered. (Qin et al.2021)(Wong et al., 2023)(Saleem et al.2022)(Anasori et al.2022)

During a crisis, even the smallest team of people might save someone's life. The conclusions drawn from this review are considered for developing policies to support health professionals in primary care. The rationale for studying resilience specifically in the context of primary care professionals working in emergency departments, such as physiotherapists and radiologists, is discussed. In addition, during psychological survey responses and negative environmental information from healthcare leaders, there are roadblocks and multiple change initiatives in place for the continued environmental enhancement of health-steady staff in harm's way. Several promising health management drives employee satisfaction. The occurrence of emotion management and outcomes may create an efficient investment in promoting the resilience of nurses who work diligently.

1.2. Scope and Objectives

1.2. Scope and Objectives. The aim of this systematic review is to explore the concept of resilience when professionals from primary healthcare are concerned. The article is mainly focused on three medical specialties: physiotherapists, nurses, and radiologists. All of them are part of the front line, and their daily work helps them to be in direct contact with people. Each of the three equally involved groups of professionals has been analyzed in individual entries. The parameter that distinguishes professionals specializing in these problems is the stress process with which they are involved in the context of their emergency departments. In the discussion section, we show all of the challenges participants face and the strategies that may be useful to support them and to increase their resilience.

The objectives of this review are as follows: (1) To systematically search the resources relevant to the topic and summarize the available and current knowledge about the characteristics of resilience of the physiotherapist, nurse, and radiologist in emergency contexts. (2) To identify the challenges they face in this context and provide an emotional reaction. (3) To highlight the strategies that can increase professional resilience. The main purpose of the review is to provide cues that enable a more profound understanding of the potential areas dedicated to professional resilience in the wake of the literature. Particularly valuable is the experience of the three emergency specialists. The comparison will highlight the specific programming areas of professional staff and discuss their individual reviews in the reinforcement of professional competence in the ethical field. Currently, there are still areas where knowledge is neglected and where interventions could occur. Our main intention is for readers to consistently look beyond the simple summary of the identified literature, reviews, and research deemed useful, on which the specialist intervention focus could be actually centered. This is aimed at creating evidence-based knowledge of actionable interventions to increase resilience.

2. Understanding Resilience in Healthcare

Resilience is a topic that has become increasingly relevant in the field of healthcare professionals. Healthcare has adopted a more comprehensive and intersectoral definition as a result of the recent review of the literature on the concepts of resilience, both from psychological and sociological perspectives. Psychologically, resilience is considered an ability to recover from adversity and, once this stage has been overcome, to become stronger. It goes beyond an adaptive response, affording unexpected benefits in terms of personal growth, but it is contextually adaptive, with the risk of transforming transitory suffering into trauma or stress-induced pathologies. The resilient individual is therefore flexible and made stronger by the experience, and shows greater empathy for others in a situation of distress. Sociological analysis places resilience within a person's social sphere: individual and community processes associate and mutually influence each other. (Pahwa & Khan, 2022)(Berástegui and Pitillas2021)(Yu et al., 2022)(Bakic & Ajdukovic, 2021)(Huang et al.2023)

Resilience is a resource for healthcare professionals in order to cope with stress and adversity. An emergency is, by definition, a critical clinical event and one of the situations that generates occupational stress. Over recent years, emergency departments have initiated programs of action to promote, protect, and support the well-being of healthcare professionals. Indeed, the permanent exposure to these critical scenarios, both in the physical sphere and in the emotional area, can take health professionals to certain limits that can affect their own health as well as the quality of patient care. Despite adversity, healthcare professionals can experience positive outcomes. An increasing number of studies have been conducted in an attempt to capture optimistic phenomena such as professional satisfaction, enthusiasm, improvement, or well-being. Obtaining good results or satisfactory findings in situations of stress or adversity will depend on available resources. Resilience stands out as one of the most widely studied resources. In contrast, and despite the association between burnout and engagement, there are no studies reported that have investigated the association between resilience and engagement among healthcare professionals in the emergency department. In the field of radiology, during patient care, stressful situations can occur. Resilience can play a role in how to deal with and how to recover from such moments. A team should be able to cope with both expected and unexpected tasks. In the case of primary healthcare, especially in emergency care, characteristics such as flexibility, problem-solving abilities, and the ability to cope with stress are relevant. In addition, resilience could contribute to job satisfaction and reduce the incidence of burnout.

2.1. Definition and Conceptual Frameworks

Exposure to negative work stress can play a role in the onset of common mental disorders, such as depression and anxiety. However, in the professional field, the phenomenon of "resilience" is not only about reaching zero or a state of absence of damage as a result of adversity; it is also about overcoming and growing from it. The term was initially related to the study of child development and later concentrated in the area of mental health. Mental health is defined as a state of well-being where the individual realizes their abilities, can cope with the normal stresses of life, can work effectively and fruitfully, and is able to make a contribution to their community. The overriding idea of "resilience," understood as the ability to live and work even in difficult situations, takes on a "humanistic" connotation when it is considered that a union of victims can become harmful in itself. For this reason, it is suggested that, for a better approach to the analysis of professional resilience, greater attention should be paid to the concept of "psychological capital."

Resilience means the assets that a health professional makes available to adapt to change or manage difficult situations; methods of managing events are used for situations such as those described. From the point of view of the literature, the diverse titles attributed to the phenomenon are worth noting, which can be broadly divided into the interest focused on specific sectors or individual characteristics of resilience and coping strategies. Most researchers agree that resilience is a multidimensional construct composed of several factors. Indeed, the models used propose the joint analysis of aspects related to individual and organizational variables because one inevitably influences the other. The approach from the bottom up instead insists on the consideration of the individual resources that operate and function in the workspace, to cultivate a community of professionals capable of always growing in the face of disasters. Some researchers have attributed the term "coping" to adaptive strategies, which are those strategies that govern body-mind unit behavior in response to new environmental stimuli, trying to predict and monitor these stimuli properly. "Resilience" instead defines the set of individual characteristics that allow us to heal efficiently, avoiding the social image based on the role of victims.

2.2. Importance of Resilience in Primary Healthcare

Resilient health care is a hot topic at the moment. In times of acute stress and worry, such as during a worldwide pandemic, research continues to emerge into the many facets of resilience in several areas. Health care professionals benefit from personal resilience in various ways. In addition to providing high-quality patient care, it enables professionals to make better medical decisions, especially under duress, to focus, prioritize, and pay attention to the various pathways that occur in emergencies. While every effort is made to reduce the possibility of harm to others and oneself, it has been shown that stronger resilience can facilitate the growth of medics despite working in a high-quality environment. (Heath et al.2020)(Wald, 2020)(Rieckert et al.2021)(Kunzler et al.2020)(Aughterson et al., 2021)(Finstad et al.2021)

It has been clearly demonstrated in various healthcare professionals that the degree of professional resilience is inversely related to stress. Most jobs in healthcare settings, especially high-intensity ones, are involved. The incidence of burnout is far greater than in the general population. Nurse turnover in crisis areas is rising nearly four times over the same period as a result of poor personal and professional judgment. High-pressure teams, strong perspectives, and life-changing decisions all make proper resilience practices essential not only for individuals but also for whole teams. Moreover, non-resilient individuals, when reacting to crises or poor personal and professional events, can actually cause a chain reaction that spreads to other members of the care team. Research on team resilience is only just beginning, and early results suggest that resilient, well-connected teams lead to better health, and organizational health is more practical overall. In addition, in all types of industrial teams, research suggests early evidence to support the cascade of resilience-positive chain effects on team quality as a whole. This review may represent an early step in translating the report's content into useful evidence capable of guiding health care organizations and policymakers in adopting evidence-based and systematic efforts for the current widespread workforce of primary care professionals through education, training, and other interventions that aim to strengthen and cultivate personal resilience and the resilience of teams. (Hu et al.2021)(Pappa et al.2021)(Hewitt et al.2020)(Afonso et al.2021)

3. Resilience Among Physiotherapists

Physiotherapists can be the first health professionals to have contact with a patient in an emergency department. This contact may be in the emergency department itself, in an area dedicated to evacuation through an emergency room, or even as part of a multidisciplinary team that places a 'trauma call' activation to evacuate patients from a scene. Physiotherapy in emergency settings gives physiotherapists the opportunity to work with patients with a wide variety of medical diagnoses and presentations. Physiotherapists also have to work with patients from the very young to the very old, patients who are independent to those who are completely dependent on another person for everything, patients with a 'get up and go attitude' who want minimal assistance to those who need a lot of coaxing and motivation. (Goodwin et al.2020)(Greenhalgh et al., 2020)(Kleiner et al.2023)(Morera-Balaguer et al.2021)(Demont et al.2021)(Jácome et al.2021)(Thomas et al.2022)

Physiotherapists help their patients with some of the most basic things in life, such as breathing, communication, and moving, which have the potential to allow someone to live or die. Any physiotherapy role in an emergency department is challenging and demanding. Physiotherapists performing this role can potentially change not only a patient's life trajectory but also the patient's activity and life years they will have after discharge from the emergency department. Physiotherapists rated the challenge of their work as one of the more positive aspects of their role. Working in emergency settings can be an emotionally intense and physically demanding role. Interventions that build resilience in physiotherapists can help in reducing the negative consequences of that stress. There are a number of personal and professional development approaches that can be effectively used with physiotherapists and multidisciplinary teams to enhance their resilience when working in an emergency setting. Coping mechanisms used by physiotherapists to manage this stress have been discussed at length and can guide interventions to build the resilience of physiotherapists. (Latzke et al.2021)(Kleiner et al.2023)(Salles and d'Angelo2020)(Gleadhill et al., 2022)(Bennell et al.2021)(Estel et al.2022)(Majsak et al.2022)

Continuous professional development and receiving mentorship or coaching from senior physiotherapists had a positive impact on working with people who can be difficult and on building resilience. Building an effective support system in emergency medicine will motivate the workforce but will also assist in creating a stable and resilient workforce. A representative case study would be an extremely busy man who works shifts trying to fit in marriage, family, paid work, fortnightly scheduled voluntary work, and community service when needs arise. Working since 17, he has taken one significant period of his personal time off over the past 23 years. He has had severe workplace stress and trauma and a workplace injury along this

journey but overall has a steadiness about him. He has help from a supportive wife and daughter, understanding employers who provide a flexible working arrangement, and an Employee Assistance Program. He also leverages support from friends, an employed psychologist, and informal peer support. His resilience is built from the arsenal of coping mechanisms he has developed over time.

3.1. Challenges Faced in Emergencies

3.1.1. Rapid Decision-Making Healthcare professionals working in emergency care face rapid decision-making processes due to the necessity of resolving more than one clinical condition in record time. Physiotherapists, despite being unable to diagnose, are directly involved in clinical decisions due to their capacity to assess patients, treatments, and follow-up. Furthermore, emergencies are complex clinical situations, and the availability of sophisticated resources is often limited for short handling treatments. In this context, physiotherapists continuously choose treatment options that combine more than one action, respecting and protecting the patient.

3.1.2. Psychological Impact Physiotherapists who provide care for acutely or critically ill patients in an intensive care unit and in emergencies may be exposed to psychological risks, as these situations can be potentially stressful. This stress may also be the result of the patient's clinical instability or from having to start or discontinue a professional's care for situations of vital risk. Moreover, major injury or illness can have direct impacts on intimate relationships, interpersonal and family relationships, and societal and family roles. A physiological view of acute disease and critical life events informs medical treatment, but psychological, social, cultural, and spiritual factors influence the meanings that individuals will give to these events and influence their coping mechanisms.

3.1.3. Role Ambiguity During an emergency, for various reasons, there is potential for role ambiguity and overlap between the roles of each of the team members and sections. For professionals such as radiologists and nurses who are not present throughout the emergency treatment, physiotherapists are not exactly clear as to which patient was accepted as deserving a radiological exam and waiting for it, and which patient should already have had it at any point in the course of their illness. The waiting period for the patient means that the therapist is unable to guide the pragmatic decisions about the patient without imaging findings, and further shifts their resources as well as the timing of the examination, leading to delays in service.

3.1.4. Communication Barriers A patient who is transferred to a healthcare professional may not be able to cooperate for physical treatment in some clinical conditions. This may be unintentional in these conditions and may be due to a lack of understanding or weakness. In emergency departments, patients who are unable to coordinate can be transferred to an observed bed and can also be accompanied by physically healthy relatives or caregivers who generally convey cues and communicate on behalf of the patient, unintentionally not transferring all information. (Høyer et al.2022)(Haleem et al., 2021)(Felten-Barentsz et al.2020)(Roppolo et al.2020)

3.2. Strategies for Building Resilience

Individual and organizational strategies have been shown to increase the resilience of physiotherapists working in emergencies. Training in resilience and protective factors has been reported as effective and a beneficial complement. Evidence-based interventions for morale boosting have also been suggested. From these findings, practical recommendations for the development of physiotherapists' resilience have been formulated. However, it has been stated that further studies are needed to confirm the impact of resilience-building interventions. (da et al.2022)(Pigati et al.2022)(Cardile et al.2023)(Health Organization, 2023)

Resilience training programs have been identified as one of the ways to increase the resilience of healthcare professionals. Such programs prepare practitioners to practice mindfulness, cultivate awareness, and learn effective strategies for managing stress. The aim behind preparing physiotherapists is to foster an ability to cope and adapt positively. A resilience-building course for those working in an emergency department has been shown to have a positive impact on participants. They learned to focus on the aspects of their lives that they value most, instead of allowing their working environment to dominate their thoughts and relationships during the course. This allowed for the rediscovery of the joy of work. Both were shown to influence adaptive capacity, one of resilience's protective factors. It is suggested to start small, using simple, low-cost strategies and formal programs to promote a culture of resilience and commit to doing no harm to your peers. (Huffman et al.2021)(Ngoc et al.2021)(Giordano et al., 2022)(Walsh et al., 2020)(Eliot, 2020)

4. Resilience Among Nurses

Nurses are in a unique position relative to other healthcare professionals, since they often bear a high stress load. Such stressors are important, especially in emergency services, since they address a lot of patients

with different conditions, from minor ones to life-or-death situations. Moreover, they work long hours, and many challenges are inherent to their work environment, including high acuity of the patients, heavy workload, lack of sleep, and the requirement of emotional labor as part of their role. Also, nurses are advocates for patients and their families, and they witness suffering on a regular basis. All of these reasons contribute to a heightened need for understanding and addressing resilience in nurses. In general, job stress, as seen in healthcare professionals, leads to a worsening of the psychopathological status, including anxiety, depression, or post-traumatic stress disorders, but also to negative appraisals and unfavorable organizational outcomes such as job dissatisfaction, burnout, decreased motivation, and low productivity. High job stress might be prevented or managed by different strategies, including individual and system approaches or enhancing community resources. Different training programs and available mental health resources, including exercise and physical activities, relaxation methods, individual and group therapy or counseling, and different wellness programs, including outdoor and sports activities, building positive emotions, yoga, Pilates, or mindfulness, have been studied and applied in stress coping, often by reducing burnout and anxiety in healthcare environments and increasing some components of psychological well-being. Additionally, research has shown that resilience enhancement in physicians correlates with an increase in mental well-being and their overall practice. Both individuals and organizations need to be addressed when considering providing resilience-enhancing strategies to healthcare professionals. Additionally, interventions focused on teamwork and adequate communication have been developed to enhance resilience. In nursing, interventions that have been globally studied encompass resilient training programs that might help with emotional regulation, team cooperation, time management, and communication. For instance, the implementation of a self-care alliance for nurses, a cognitive-behavioral based intervention that includes self-care education for individuals and managers, yoga, and stress management strategies, has improved nurse resilience, measured through decreased stress levels, mistakes, and sick leave. As another illustration, a short period of resilience training, which includes weekly coping and restoring resilience modules over four weeks, has increased resilience and coping strategies in newly hired graduates in an emergency role. Furthermore, in a qualitative study conducted after the introduction of a nurse resilience training program, themes including increased personal strengths, internal resources, new perspectives, thoughts, and feelings, the establishment of healthy habits and customer relations, and the experience of sharing among others were reported. (Ericsson et al.2022)(Kongcheep et al.2022)(Goldsby et al., 2020)(Wu et al., 2020)(LeClaire et al.2022)(Hwang & Park, 2022)(González-Pando et al.2022)

4.1. Unique Stressors in Nursing Practice

Nurses deal with high-stress, demanding situations in their professional practice; they are particularly susceptible to physical and emotional ailments during emergencies. Factors such as increasing patient loads, emotional stressors derived from horror, fear, or despair, and trauma exposure are associated with work-related pressure and exhaustion, manifesting as psychological burnout, a physical and/or emotional collapse, resulting in diminished effectiveness in job performance. This increases substance abuse, dissuading taking time off due to the ideology of ignoring problems. Those involved in an emergency are particularly susceptible to moral injury and all that it entails. Assisting those in horror or distress is the threshold in nursing, and handling the psychological recoil from their experiences is arduous. Last, comparing the physical environments lived in by a general nurse to an ED nurse, the variation is vast. ED nurses contend with ever-changing rosters and staff shortages, with higher rates of injury and violence. (Lam et al.2020)(Kisely et al.2020)(Riedel et al.2021)(Chou and Tseng2020)(Jiménez-Herrera et al.2020) Stressors cannot be regarded as generic; rather, they need to be contextualized by the specialties they occur within. Some of the emotional necessities identified for nurses working in an ED have been summarized and are in stark contrast to those emotional requirements in chronic health disease and ambulatory care. Those working within highly stressful areas of acute care require an acute understanding of how physical and emotional safety needs, moral injury, absent healing, and eternal internal conflict are navigated. The issues ED nurses experience that impact mental health are comprehensive but are not isolated to just this department. Factors have been summarized: violence, stigma, patient complexity, workload, bullying and harassment, and exhaustion. Institutional support ensures management recognizes the nurse's emotional struggle post-traumatic event through services like debriefing. These stressors are not limited to acutely focused environments but are simply augmented when dealing with the acutely unwell or with demanding higher-level trauma emergencies. For resilience to grow, and for the burgeoning number of potentially single-point psychologists to truly understand the biomedical workforce they are servicing, a clear and concise definition of the stressors in the workplace needs to be advocated for. Only then can a

multidisciplinary team mitigate these unique occupational challenges. (Abdelmageed et al.2024)(Warwas et al.2023)(Elder, 2024)(Thorpe, 2024)(Prentice et al.2023)(Boren & Veksler, 2023)

4.2. Interventions to Enhance Resilience

There are a number of interventions that have been suggested to enhance resilience. Practitioner-based or individual interventions range from the provision of resilience and stress management training, including mindfulness-based stress reduction, as well as further psycho-education about coping and burnout. This includes the provision of online resources to support well-being, personal and professional development programs in support of resilience and leadership training, the development of a self-reflective approach by practitioners, spiritual health programs for nurses, and profession-specific interventions. For example, there are mentoring programs and a discussion forum for nurses in Emergency Departments, and there is consideration of developing tools and resources to support nurses working in rural and remote areas with limited resources. Organizational-based interventions to improve individual resilience vary from peer support programs, clinical supervision, structured wellness and health programs, including both exercise programs for staff and flu clinics, learning programs that promote skills like debriefing after emotional events, supervision, recognition programs, professional care rounds, and clinical tools and resources. (Şahin and Türk2021)(Hatice2021)(Ahmad et al.2022)(Khalifi & Bahrami, 2020)(Aslan & Tanhan)

A wellness program providing access to physical and psychological resources, including seminars, training, and peer support programs, was implemented. All nursing divisions were involved, and since the implementation, providers report increased knowledge and use of management techniques, increased staff satisfaction with access to resources, and a staff survey rated the hospital as having "healthier staff" than other hospitals. Two years after a hospital relocation, it was reported that a new emergency department mentoring program and the newly implemented Clinical Care Resource team delivered informal debriefing sessions. Positive feedback was received from nursing staff about their increased knowledge and skills regarding the mental effects of trauma, their improved ability to work with aggressive patients and visitors, and their improved judgment regarding discharges against medical advice. The discussions were "Good for morale." Twelve months after a tornado, it was found that an internal pilot of an employee support team was able to positively affect the delay of the development of post-traumatic stress disorder in those employees who required assistance. (Patrician et al.2022)(Buch et al.2021)(Ha et al.2022)(Melnyk et al.2022)(Bonner & Crowe, 2022)

5. Resilience Among Radiologists

Radiologists, and to a lesser extent radiographers, are among the medical professionals providing medical care in emergency and urgent settings. Radiologists must make a diagnosis quickly and accurately in complex situations with high uncertainty for the benefit of severely fluctuating patients. In such cases, stressed radiologists are a burden to both themselves and the department and hinder positive patient outcomes. There are many causes of stress; some are specific to interventional radiology, while others pertain to other types of radiotherapy. The constant introduction and adoption of new devices, techniques, and increasingly, information and communication technologies are other aspects specific to the profession, which may cause a modification of the way work is performed and cognitive function. The concept of resilience is linked with that of professional satisfaction and bad behavior, which derives from the two previous aspects. Fostering resilience, like humility and empathy, is a way to curb the deleterious effects of stress in radiotherapy. Many proposals can be made concerning protective strategies and their features; some can be illustrated by realistic examples to make them more easily recognizable. Limiting the causes of suffering is an asset. It goes without saying that this process is not the sole responsibility of the physician. Resilience has been shown to play a major role in the conduct of medical activity. Discussing resilience with a deep knowledge of the radiologist profession might lead to actions for training in areas of professional activity that have not yet been considered as such but contribute to increasing radiologist resilience. (Hartung et al., 2020)(Hussain et al., 2022)(Alexander et al.2022)(Najjar, 2023)(Ghayvat et al.2023)(Tsuneki, 2022)(Lecler et al., 2023)

5.1. Role of Radiologists in Emergencies

In emergencies, radiologists play a crucial role in diagnosing, prescribing, and managing patients with acute pathologies that range from neonates to geriatrics. In some serious conditions, any time delay can prove detrimental, so the role shifts to being a therapeutic decision. Often, life-threatening or function-threatening pathologies and those requiring intervention are expected to be managed in emergency care settings. However, these tests lead to diagnostic imaging overload in the emergency department and, in conducive settings, consultation with radiologists and occasionally teleradiologists. Both primary and ambulance care professionals dealing with urgent imaging may interact directly or indirectly with

radiologists. Since these are critical decisions, with potentially severe consequences for patients, errors can occur when there is poor or no interaction between radiologists and primary healthcare. (Nasir et al.2020)(Stogiannos et al.2020)(Chamorro et al.2021)(Brizi et al.2021)(Hussain et al., 2022)

Radiologists are responsible for being alert for acute imaging features of serious diseases, many without provocation, and often in the very infrequent. Research has highlighted the ongoing incidence of complaints and adverse outcomes associated with diagnostic imaging in emergencies. Their work in an emergency can often bring about feelings of relief and fulfillment but equally anxiety and worry, which encompasses feelings of helplessness. The issue of resilience in radiology is, therefore, multi-dimensional. To equip professionals for this work, immersion and emergency radiology training is gaining ground in some radiology training programs. (Ching and Cheung2021)(Yongcun et al.2021)(Zhou et al.2024)(Ziesche et al.2023)(Yuan et al.2024)(Ma et al., 2024)(Li et al.2023)

6. Comparative Analysis Across Specialties

Resilience is prevalent in all three medical specialties. All of the professional groups work under difficult conditions and in various levels of stress. The strategies to cope with stress and to increase resilience encompass transcendental, pragmatic, and existential categories. Although this study presented more differences among the strategies and challenges across the specialties, the results reinforce the complexity and versatility of the resilience theme, both by presenting peculiarities in the aspects related to the three included professions and by not observing isolated findings or strategies, which reinforces that resilience should not be viewed as a transcategorical aspect.

In nursing, intervention to develop resilience seems positive, which contributes to the humanization of care, using strategies of specific intervention, investing in individual development and team development, so that they can develop mechanisms to combat triggering stressors. However, some studies state that developing resilience takes time, about one year with interventions. Given the multifaceted understanding of resilience, some differences between the medical specialties that compose this study were assessed: individuals from professional groups have revealed the ability to cope with trauma and stress, in addition to analyzing specific resilient attributes that compose the professional of in-service radiology work. In stressful situations, the body and soul are impacted, and the mind needs to identify values, resist, and transcend difficulties. All professional categories present their own strategies to develop resilience and cope with traumatic and stressful situations. Given the contextual peculiarities of the professions that make up this study, the intervention of strategies to develop resilience must be contemplated based on the peculiarities of the healthcare professional categories, respecting the coping capacity of each. (Kunzler et al.2020)(Albott et al.2020)(Reeve et al.2020)(Kangas-Dick and O'Shaughnessy2020)(Reed et al.2020)(Litvin et al., 2020)(Kegelaers et al.2021)(Vella et al.2021)

7. Conclusion and Future Directions

This systematic review has established a number of insights into the resilience of primary healthcare professionals that span both medical specialties and professional groups. Some of the key challenges faced by primary care professionals include the impact of poor access to the health system on morale and the mental and emotional toll of repetitive traumatic stories. Key strategies for enhancing the resilience of primary healthcare professionals include team-based care and having extra support from peers, supervisors, and family. Our results support resilience as a construct that is holistic and also needs to attend to the systemic issues of workplaces, culture, support systems, and worker wellness within them. Supporting increased resilience of primary healthcare professionals has implications for the sustained workforce in these areas, but also for patient care outcomes by enhancing the ability of professionals to show care and concern towards their patients.

Future research targeting primary care professionals in psychological emergency roles would provide new knowledge about the specific issues these roles present. From this review, it is critical to continue and expand research into strategies and interventions to enhance the resilience of primary care professionals who present in psychological emergencies and are at risk of burnout. Many of these workers are increasingly trained and encouraged to extend themselves to support respondents in natural and social disasters. Further targeted research and attention are needed into the factors that challenge these workers on a day-to-day basis and their responses to safe self-care following these onerous or traumatic events. Furthermore, attention should be paid to policies and resources that support professionals facing these issues who work in rural, remote, and undersourced services. We also recommend future research into strategies to enhance the resilience of other groups of primary care professionals, particularly in the use of high-quality randomized controlled trials. Policy changes are also needed to assist our healthcare systems in being more supportive of individuals facing these traumas at work. At a minimum, this would require

policies that assist and enhance the provision of basic training and ongoing support for all professionals in how to constructively manage the regular heavy workload, including facing the additional trauma of hearing the many tales of illness and adversity that they are faced with each week. In conclusion, it is critical to focus on developing resilience training and support services, but also to promote a culture of resilience and seek systems-based solutions that support the enhancement of psychological resilience in all health professionals working in primary care settings.

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