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COMPLEMENTARY TRAINING IN DISASTERS FOR HEALTHCARE PROFESSIONALS: AN ANALYSIS OF THE OFFICIAL OFFER IN BRAZIL AND MEXICO

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ABSTRACT

Objective: to identify courses available online by national civil defense bodies in Brazil and Mexico to assist in the additional training of healthcare professionals for disasters.
Method: an exploratory descriptive study, based on a qualitative approach, using technological prospecting methodology, carried out on the official Civil Defense websites in Brazil and Mexico.
Results: ten courses offered by the Government of Mexico's National Center for Disaster Prevention were found, nine of which were short-term and one offered as vocational training. All of these courses were synchronous. In Brazil, 36 courses were located, all in asynchronous formats, with durations varying between 20 and 50 hours. Although the courses presented programmatic content that included activities inherent to healthcare professionals, none of them made specific mention of professionals in this area as the target audience.
Conclusion: the prospective study reinforces that Information and Communication Technologies for distance education present themselves as an alternative present in both countries in terms of additional training for disasters, although not yet specifically aimed at healthcare professionals. The need to include this area of interdisciplinary and multi-professional content reflects gaps in sector integration.

DESCRIPTORS: Education in Disasters. Education, Nursing. Education, Distance. Information Technology. Disaster Risk Reduction.

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FORMAÇÃO COMPLEMENTAR EM DESASTRES PARA PROFISSIONAIS DA SAÚDE: UMA ANÁLISE DA OFERTA OFICIAL NO BRASIL E MÉXICO

RESUMO

Objetivo: identificar cursos disponíveis *on-line* pelos órgãos de defesa civil nacional do Brasil e do México visando auxiliar na formação complementar de profissionais de saúde para desastres.
Método: estudo descritivo exploratório, a partir de uma abordagem qualitativa, utilizando a metodologia de prospecção tecnológica, realizada nos sites oficiais de Defesa Civil do Brasil e do México.
Resultados: foram encontrados 10 cursos oferecidos pelo Centro Nacional de Prevenção de Desastres do Governo do México, sendo nove de curta duração e um oferecido como curso técnico. Todos esses cursos na modalidade síncrona. No Brasil, localizaram-se 36 cursos, todos em formatos assíncronos, com duração variável entre 20 e 50 horas. Embora os cursos apresentassem conteúdo programático que incluía atividades inerentes aos profissionais de saúde, nenhum deles fazia menção específica aos profissionais desta área como público-alvo.
Conclusão: o estudo prospectivo reforça que as Tecnologias da Informação e da Comunicação para educação a distância se apresentam como uma alternativa presente em ambos os países quanto à formação complementar para desastres, porém, ainda não direcionados especificamente aos profissionais da saúde. A necessidade de inclusão desta área de conteúdos interdisciplinares e multiprofissionais reflete lacunas de integração de setores.

DESCRITORES: Educação em desastres. Educação em enfermagem. Educação a distância. Tecnologia da informação. Redução de riscos de desastres.

FORMACIÓN COMPLEMENTARIA EN DESASTRES PARA PROFESIONALES DE LA SALUD: UN ANÁLISIS DE LA OFERTA OFICIAL EN BRASIL Y MÉXICO

RESUMEN

Objetivo: identificar cursos disponibles en línea por los organismos nacionales de defensa civil en Brasil y México para ayudar en la capacitación adicional de profesionales de la salud para desastres.
Método: estudio descriptivo exploratorio, de enfoque cualitativo, utilizando metodología de prospección tecnológica, realizado en los sitios web oficiales de la Defensa Civil de Brasil y México.
Resultados: se encontraron 10 cursos ofrecidos por el Centro Nacional para la Prevención de Desastres del Gobierno de México, nueve de los cuales fueron de corta duración y uno se ofreció como formación vocacional. Todos estos cursos fueron sincrónicos. En Brasil se ubicaron 36 cursos, todos en formato asincrónico, con duraciones que variaron entre 20 y 50 horas. Aunque los cursos presentaron contenidos programáticos que incluyeron actividades inherentes a los profesionales de la salud, ninguno de ellos hizo mención específica a los profesionales de esa área como público objetivo.
Conclusión: el estudio prospectivo refuerza que las Tecnologías de la Información y las Comunicaciones para la educación a distancia se presentan como una alternativa presente en ambos países en términos de capacitación adicional para desastres, aunque aún no dirigida específicamente a los profesionales de la salud. La necesidad de incluir esta área de contenidos interdisciplinarios y multiprofesionales refleja brechas en la integración del sector.

DESCRIPTORES: Educación en Desastres. Educación en Enfermería. Educación a Distancia. Tecnología de la Información. Reducción de Riesgo de Desastres.

INTRODUCTION

According to a report published in 2022 by the Intergovernmental Panel on Climate Change (IPCC), these, induced by humans, are already occurring, causing heat waves, intense precipitation, droughts and tropical cyclones. Among the planet's possible climate futures is continued global warming, which should intensify the global water cycle and worsen the intensity of wet and dry events[1].

A study carried out in the United States linked data on the annual number of disasters in billions of dollars, global carbon dioxide levels, average temperature and deaths for the period from 1980 to 2021. The results pointed to a direct relationship between CO_2 levels, average temperature and total disaster spending, indicating a predicted increase in the number of extreme events[2].

In Brazil, based on data extracted from the Integrated Disaster Information System (S2iD – *Sistema Integrado de Informações sobre Desastres*), 51,184 disasters were identified, recorded from January 1, 2013 to December 31, 2021. Of these disasters,50,481 were caused by natural threats and 703 by technological threats. Considering that pandemics are classified as natural disasters of a biological nature, there was a significant increase in disasters due to natural threats that occurred in 2020 and 2021[3].

Mexico has a long history of disasters, mainly due to its geographic location. The most recent, an earthquake that occurred in 2017, killed more than 370 people. Furthermore, the rainy season, associated with the closed nature of the river basin and continuous soil sinking induced by extraction of water from the ground, creates a permanent threat, especially in Mexico City, the country's capital[4,5].

According to annual data produced by the Disaster Prevention Center (CENAPRED – *Centro de Prevenção de Desastres*), the impact of disasters in Mexico, during 2000-2019, involved 3,765 human losses, 56 million people affected and approximately 1.8 million homes damaged. Economic damage was around US$40,350 million[5,6.]

With the aim of strengthening the capabilities of the team working in civil protection activities, CENAPRED, through the National School of Civil Protection, created the Annual Distance Training Program. In the format of Massive Open Online Courses (MOOC), these are offered annually and are published on the official government website[6].

In 2022, the National Civil Protection Department (SEDEC – *Secretaria Nacional de Proteção Civil*) formulated the Continuous Training Plan in Civil Protection. Based on guidelines and principles from the Sendai Framework, new policy establishes a continuous training base, between 2019-2023, expanding the use of Distance Learning technologies and platforms and strengthening the training mechanisms proposed by the plan[7].

The Sendai Framework for Disaster Risk Reduction – 2015-2030 – proposes considerations on the risks of climate change as well as planning better projects and actions to help communities increase resilience to disasters. Documents such as the Sendai and Hyogo Framework place Primary Health Care as a central point for preparing for and responding to disasters[8].

In many situations, cataclysms are intensified by social determinants and health inequalities, which increase risks for poorer families and communities. This often results in significant impacts on the health, social, economic, political and cultural sectors, highlighting the need for greater attention from the scientific community in formulating more effective standards for prevention, preparation, response and recovery from these events[9].

Healthcare professionals play a fundamental role in the disaster cycle. Nursing professionals, as they have solid scientific, technical, ethical and humanistic training skills, work in the psychological, spiritual and physical dimensions as well as in ethical principles related to the care process during catastrophe situations[10].

However, disasters reflect a globalized, progressively regular problem, whose use of health technologies in "forms of knowledge applied to the solution or reduction of health problems of individuals or populations"[11] assists in the work process and continuous updating for disaster relief. The Information and Communication Technologies (ICTs) that use internet resources in research and information production stand out for this study[12].

Through ICT, teaching, mediated by using technologies or e-learning, supports the design of educational environments and the creation of learning situations that are based on the exploration of a vast quantity and diversity of resources available on the Internet, promoting the sharing of experiences among all participants[13].

In the health area, the advancement of educational technologies (ET) stands out in supporting educational practices in different contexts and for different audiences. hese practices aimed not only to disseminate information, but also to promote self-care among the population[14].

In 2019, the World Health Organization presented the Global Digital Health Strategy with the perspective of expanding national efforts through collaboration and knowledge sharing between countries, research centers, companies, health organizations and user or citizen associations. The purpose is to drive health promotion for everyone everywhere[15].

Among its objectives are: 1) Promote global collaboration and advance the transfer of knowledge about digital health; 2) Promote the implementation of national digital health strategies; 3) Strengthen governance for digital health at global, regional and national levels; 4) Advocate for people-centered health systems that are enabled by digital health[16].

However, acting in these contexts requires specific knowledge about the complexity of preparing, preventing, responding to and recovering from impacts. The present study seeks to identify courses available online by national civil defense bodies in Brazil and Mexico, aiming to assist in the additional training of healthcare professionals for disasters. The choice for both countries was due to the availability of information about the courses offered online and free of charge on official websites in the departments of defense and civil protection.

METHOD

This is an exploratory descriptive study, which uses technological prospecting methodology as a research tool to identify which online courses are being offered by national civil defense bodies in Brazil and Mexico, aiming to assist in the additional training of healthcare professionals for disasters.

Technological prospecting was chosen because it is a research tool that makes it possible to map existing technologies and learn about points for improvement to create new tools[17]. Furthermore, technological prospecting studies are a powerful instrument for directing the development of new technologies, as they assess the existence of gaps or saturation in relation to products already available on the market[18].

Technological prospecting is usually divided into four phases: 1) preparatory phase with definition of objectives, scope, approach and methodology used during prospecting – a search protocol being developed validated by four experts in nursing and science and health management information; 2) pre-prospective stage, during which the methodology is detailed, together with data source identification; 3) prospective stage, which covers the collection, processing and analysis of the data obtained; and 4) post-prospective stage, the conclusive phase of the process that involves dissemination of results, implementation of actions and monitoring[19–21].

After this step, official website sources of the Civil Defense of Brazil and Mexico were accessed, using the keywords disaster education, technology, education, online courses. Free online courses, offered by the Brazilian and Mexican governments, in 2023, with available information on objective, duration, target audience, content, synchronous or asynchronous modality, were included. Courses

that were not offered by the federal governments of each country, paid courses or courses that did not have available information were excluded. After extracting the data from the courses selected from the sources, they were organized into tables according to information on title, objective, duration, target audience, content, synchronous or asynchronous participation modality.

RESULTS

Selection totaled 10 courses offered by the Government of Mexico's National Center for Disaster Prevention, of which nine were short courses (5 hours) and one was offered as vocational training (462 hours). All courses in synchronous modality, based on online registration, offered on a single date and published through a call notice on the official government website (Chart 1).

In Brazil, the courses selected according to criteria were offered by the National Department for Civil Protection and Defense (SEDEC – *Secretaria Nacional de Proteção e Defesa Civil*), made available on the *Escola Virtual Gov* (EVG) platform. A total of 35 asynchronous courses were found, in which participation occurred through registration and recording, starting immediately and with a workload of between 20 and 50 hours. All courses are offered openly, free of charge and with a certificate, and anyone can sign up (Chart 2).

In Brazil, the courses were subdivided into categories: Distance Learning training for integrated risk and disaster management; Distance Learning training in civil protection and defense; Distance Learning training for contingency plan preparation; Monitoring and alerting; and Distance Learning training to use the Integrated Disaster Information System – S2iD.

The following courses were found with introductory content on disasters: Disaster risk reduction, in Mexico; and Integrated risk and disaster management, in Brazil. Both courses were aimed at providing general notions about the national policies of each of these countries.

In Brazil, the Distance Learning training category for using the Integrated Disaster Information System – S2iD – offers 23 courses. It is used for federal recognition of an emergency situation or state of public calamity, requesting resources, monitoring works and rendering accounts. The courses offered in this category are divided by system user, who will make the request, whether federal, municipal or state.

In Mexico, one of the courses found was on alert systems, aimed at training employees who work in disasters, early warning system, whose content covers alerts for volcanoes, earthquakes, tsunamis and hydrometeorological phenomena.

Regarding the type of disasters, among the courses offered by Mexico, three were found specific to disasters (hazardous substances; landslide; and socio-organizational disaster risks). In Brazil, three specific courses were also available (contingency plan preparation for the risk of mass movement disasters; contingency plan preparation for risks arising from dams; and technical aspects of geo-hydrological extremes in the country and regional differences).

As for the target audience, the Mexican government's calls, published for short courses, prioritize first responders in disasters and people linked to the topic of civil protection. In the case of Basic Vocational Training in Comprehensive Risk Management, there is no targeted target audience, only mention of people related to the area of civil protection.

As for the courses made available by SEDEC, in Brazil, they are open to the general community, but with an initial distinction for target audience according to the subdivision of categories, such as those offered to employees directly linked to disasters (civil defense agents, public servants responsible for requesting and applying resources and providing accounts).

In the courses researched, in neither country was an indication of a target audience specifically aimed at healthcare professionals found, even though the program content contains themes of recognizing risk scenarios, contingency plan preparation and assistance to victims.

Chart 1 – Online courses offered by the Mexican government in 2023.

Course	Objective	Synchronous/ asynchronous
Short courses (5 hours) **Target audience:** Public servants who are first responders to disasters and people who carry out activities related to Civil Protection.		
Disaster risk reduction	Present the concept of disaster risk reduction and application in concrete actions to avoid or reduce damage and losses associated with the impact of disasters.	Synchronous
Dangerous chemicals	Provide a list of extremely hazardous chemicals that allows decision-making to prevent and minimize consequences of catastrophic emissions.	Synchronous
Landslide	Contribute to the identification, zoning and mapping of slope instability to strengthen Civil Protection authorities' technical capabilities and decision-making.	Synchronous
Internal civil protection program	Present its legal framework and structure through specific cases in order to recognize responsibility and actions for its implementation.	Synchronous
National risk atlas	Provide participants with the necessary knowledge to use it and its different applications in order to identify disturbing phenomena of natural and anthropogenic origin that pose a risk to the public.	Synchronous
Early warning system	Publicize about this system, as well as its components, functions and main applications in Mexico, in order to prevent the vulnerable population from possible harm caused by the presence of a disturbing phenomenon.	Synchronous
Socio-organizational risks	Recognize the different types of phenomena and socio-organizational factors that generate vulnerability and measures to safeguard the population.	Synchronous
Structure assessment	Provide knowledge to assess, with a high level of certainty and in a systematic manner, the structural safety and vulnerability of buildings, the different types of structural systems, the main constituent materials, and the different types of damage to building components and the impact they will have on reducing structural safety.	Synchronous
Incident command systems	Identify the fundamental components that make up the Internal Civil Protection Program and recognize the process of implementation by an authority and its operation.	Synchronous
Vocational training (462 hours) **Target audience:** People dedicated to Civil Protection.		
Basic vocational training in comprehensive risk management	Strengthen prevention and civil protection culture and ensure that workers in this area have the necessary knowledge and skills, generate professional development in civil protection people so that with knowledge, merit and training they occupy positions in the operation of this sector in Mexico.	Asynchronous

Chart 2 – Online courses offered by the Brazilian government in 2023.

Course	Objective	Duration	Synchronous/ asynchronous
Distance Learning training for integrated risk and disaster management **Target audience:** Public managers, representatives of municipal departments, civil defense agents, teachers and social educators, community leaders, students and professional researchers.			
GIRD+10: Integrated risk and disaster management	Know the new paradigms, strategies and tools that support actions to reduce risks and disaster occurrences and support the National Civil Protection and Defense System, based on the Brazilian National Civil Protection and Defense Policy (Law 12,608/2012) guidelines.	24h	Asynchronous
Distance Learning training in civil protection and defense **Target audience:** Civil protection and defense agents from states and municipalities, civil society and those interested in the topic of risk and disaster management.			
Civil protection and defense: introduction to national policy – Course 1	Training in civil protection and defense with an emphasis on national policy.	30h	Asynchronous
Civil protection and defense: action at the municipal level – Course 2	Present the topic of protection and civil defense with an emphasis on national policy, its main concepts and the context that surrounds it.	30h	Asynchronous
Civil protection and defense: risk management – Course 3	Present risk management steps when a disaster has not yet occurred; encompassing prevention, mitigation and preparedness actions.	30h	Asynchronous
Civil protection and defense: disaster management – Course 4	Understand how disaster management occurs, what are the main concepts and phases applied. Understand what the initial measures are, the practical response actions, the bodies involved and the social recovery and reconstruction actions as well as when to declare an abnormal situation and request support resources.	30h	Asynchronous
Distance Learning training for contingency plan preparation **Target audience:** Civil protection and defense agents from states and municipalities and civil society and those interested in the topic of risk and disaster management.			
Contingency plan preparation for disaster risks – Course 1	Know aspects related to contextualization and conceptualization and the steps in their elaboration to develop skills, abilities and attitudes necessary to strengthen the culture of disaster risk management and train protection and civil defense agents in Brazilian municipalities.	30h	Asynchronous

Chart 2 – Cont.

Course	Objective	Duration	Synchronous/ asynchronous
Contingency plan preparation for mass movement disaster risk – Course 2	Understand what they are, what the concepts and legislative aspects are related to the contingency plan applied to these types of disasters. Also know the first stage of preparation, operationalization and review of said plan.	30h	Asynchronous
Contingency plan preparation for the risks arising from dams – Course 3	Know the concepts and legislative aspects and procedures that must be followed for preparation, implementation and maintenance of contingency plans aimed at risks arising from dams based on a checking methodology defined by nine steps that contribute to planned actions being effective.	30h	Asynchronous
Monitoring and alerting **Target audience:** Civil protection and defense agents from states and municipalities; civil society and those interested in risk and disaster management.			
Training to use the public alert dissemination interface	Understand the operation and management of the Public Alert Disclosure Interface platform as well as monitor actions, alert levels, risk communication strategies, the main guidelines and good practices in using the tool.	30h	Asynchronous
Alert design methodology: from theory to practice	Deepen the main concepts related to disaster risk and understand how they are expressed in the alerts sent by CEMADEN and apply them in routine civil protection and defense work.	40h	Asynchronous
Monitoring and alert systems to support local risk and disaster management	Know the foundations, potential and products of a system, its importance for planning preventive actions for protection and civil defense. Learn to use disaster risk management instruments on a local scale as a tool to assist in the decision-making process.	30h	Asynchronous
Technical aspects of geo-hydrological extremes in the country and regional differences	Know the processes of formation of geo-hydrological events, the concepts, methods and tools used in their prediction, and their impacts in the different regions of Brazil to better interpret the bulletins, alerts, reports and other products provided by competent bodies.	60h	Asynchronous
Distance Learning training to use the Integrated Disaster Information System – (S2ID) **Target Audience:** Civil protection and defense agents, Integrated Disaster Information System users, public servants from any sphere of power, and any interested person, open course.			
S2ID – All – System access	Introduction to the system where the available tools and procedures for user registration are presented.	20h	Asynchronous
S2ID – All – Contingency plan	Understand how the process of preparing a Contingency plan occurs using the system as a tool.	40h	Asynchronous

Chart 2 – Cont.

Course	Objective	Duration	Synchronous/ asynchronous
S2ID – Municipal user – Registration and recognition	Understand how to register disasters occurring in the country and how to request support from the Federal Government, through federal recognition, or from the state, through state approval.	40h	Asynchronous
S2ID – Municipal user – Resource request for response actions	Know the steps for completing the resource request for assistance and restoration actions and their specificities.	40h	Asynchronous
S2ID – Municipal user – Executing response actions	Understand how the process of applying resources transferred by SEDEC to response actions (relief, assistance and restoration) to the disaster occurs.	30h	Asynchronous
S2ID – Municipal user – Accountability of response actions	Learn how to request a review or full return of resources and how to account for the resources transferred by SEDEC to the municipality for relief, assistance and restoration actions.	40h	Asynchronous
S2ID – Municipal user – Request for resources for reconstruction works	Enable S2iD users to understand the steps for filling out resource requests for restoration works and their specificities.	40h	Asynchronous
S2ID – Municipal user – Monitoring of reconstruction works	Learn how to use S2iD in relation to the application of resources transferred by SEDEC for reconstruction works in municipalities.	25h	Asynchronous
S2ID – State user – Registration and recognition	Understand how to register disasters occurring in the country, request support from the Federal Government through federal recognition, analyze requests for state approval and monitor their processes.	50h	Asynchronous
S2ID – State user – Resource request for response actions	Know the steps for completing the resource request for assistance and restoration actions and their specificities.	40h	Asynchronous
S2ID – State user – Executing response actions	Understand how the process of applying resources transferred by SEDEC to response actions (relief, assistance and restoration) to the disaster occurs.	30h	Asynchronous
S2ID – State user – Accountability of response actions	Know how to request a review or full return of resources and how to account for the resources transferred by SEDEC to their state for relief, assistance and restoration actions.	40h	Asynchronous
S2ID – State user – Accountability of response actions	Know how to request a review or full return of resources and how to account for the resources transferred by SEDEC to their state for relief, assistance and restoration actions.	40h	Asynchronous
S2ID – State user – Request for resources for reconstruction works	Learn how to make requests for resources for reconstruction works after the emergency situation or state of public calamity in their state has been recognized by the Federal Government.	40h	Asynchronous

Chart 2 – Cont.

Course	Objective	Duration	Synchronous/ asynchronous
S2ID – State user – Monitoring of reconstruction works	Learn how to use S2ID in relation to the application of resources transferred by SEDEC for reconstruction works in municipalities.	25h	Asynchronous
S2ID – Person on duty (all) – Monitoring	Train users to use the system to fulfill functions related to monitoring areas at risk of emergency situations or states of public calamity as well as validating disaster records in accordance with the duties and competencies of a person on duty.	45h	Asynchronous
S2ID – Federal user – Registration and recognition	Know how to use S2ID to fulfill functions related to the analysis of requests for federal recognition of an emergency situation or state of public calamity, carried out by the municipality, state or Federal District, taking into account the duties and competencies of analysts, coordinators and directors.	50h	Asynchronous
S2ID – Federal user – Resource request for response actions	Understand how to use S2ID to fulfill functions related to analysis of requests for federal resources for response actions to emergency situations or states of public calamity, comprising procedures linked to the duties and competencies of analysts, coordinators, general coordinators and directors.	40h	Asynchronous
S2ID – Federal user – Releasing resources for response actions	Learn how to use the system to fulfill functions related to the formalization of releasing resources for response actions to emergency situations or states of public calamity in accordance with the duties and competencies of analysts, coordinators, general coordinators and directors in each department and coordination.	50h	Asynchronous
S2ID – Federal user – Executing response actions	Learn how to use S2ID to monitor the application of resources transferred by SEDEC to execute response actions in municipalities affected by disasters.	35h	Asynchronous
S2ID – Federal user – Accountability of response actions	Understand how the process of accountability of approved and executed response actions occurs.	40h	Asynchronous
S2ID – Federal user – Releasing resources for reconstruction works	Learn how to use S2ID to fulfill functions related to the formalization of releasing resources for reconstruction works, in order to assist applicants in recovering damages and losses generated by emergency situations or states of public calamity.	40h	Asynchronous
S2ID – Federal user – Monitoring of reconstruction works	Learn to perform the functions related to the stage of monitoring the release of resources for reconstruction actions, which is made up of procedures linked to monitoring the progress report and analyzing the extension of deadlines and the release of installments.	20h	Asynchronous
S2ID – Federal user – Request for resources for reconstruction works	Enable S2ID users to understand the steps for filling out resource requests for restoration works and their specificities.	40h	Asynchronous

DISCUSSION

The literature shows that the role of healthcare professionals is fundamental in dealing with disasters, often in the first line of care. This requires technical knowledge and team management, leadership, quick response and self-confidence skills, which are not always worked on in regular undergraduate courses[22–24]. Furthermore, psychosocial skills of active listening, among others, are required when meeting demands and referrals to other professionals in the post-disaster network[22].

Despite the importance of these professionals in the disaster cycle, some studies show that there is a lack of preparation to meet demands related to catastrophes[23]. Furthermore, most training is focused on preparation and response rather than other phases of the cycle of these events[24].

In Brazil, the coordination of preparation and response to public health emergencies of national and international relevance is the responsibility of the Brazilian Health System through the Department of Health Surveillance. This responsibility includes collaboration with states, federal districts and municipalities through the Public Health Emergency Response Plan. However, implementing this plan requires the establishment and implementation of specific protocols and procedures, in addition to the development of contingency plans[25].

In this regard, although courses were found in both countries, indicated for instruction in contingency plans, the contents did not include an intersectoral, interdisciplinary and multidisciplinary approach, considering the health sector and area. Healthcare professionals' involvement and other areas in the development of courses and their application to a multidisciplinary target audience supports the need for coordinated and integrated actions to reduce disaster risk.

The importance of considering the type of disastrous events of major proportions, related to natural phenomena, can be expressed from a close look at their cycle, even for courses offered to civil servants, civil defense agents and the general population. When talking about warning systems, mapping of risk areas, among other actions, the recognition of each type of disaster allows response models to be considered.

This same problem appears directly related to healthcare professionals, who indicate a lack of knowledge regarding existing emergency protocols, especially in the context of irregularities in access to information, not common in healthcare services, such as those related to disasters caused by natural threats, and there is a risk of reduction or neglect of proactive outreach[8].

In the results of this study, the courses offered by the Brazilian government were presented in an asynchronous format, allowing greater flexibility in schedules for those enrolled. On the other hand, the courses offered by the Mexican government are synchronous. It is possible to observe from previous research that, although there is flexibility, synchronous moments become important due to exchange of experiences and the possibility of creating an information network on the subject[26,27].

In 2019, the World Health Organization released the "Health Emergency and Disaster Risk Management (H-EDRM) Framework", highlighting the importance of the health sector in managing disaster risks. This document poses issues such as fragmented approaches to different types of hazards, demonstrating an excessive emphasis on reacting rather than preventing events, and revealing gaps in coordination across the health system and between health and other sectors. These challenges are considered detrimental to the ability of communities and countries to achieve optimal development outcomes, including in public health[28].

The Sendai Framework's main purpose is to reduce existing disaster risks and prevent new risks, achieved through the implementation of integrated and inclusive measures in various sectors, such as economic, structural, legal, social, health, cultural, educational, environmental, technological and political. One of the global goals of the Sendai Framework is related to the health sector, focusing especially on reducing the number of deaths caused by disasters and minimizing the impact on the number of people affected[28,29].

With regard to the health sector, it plays an important role in reducing disaster risk, in particular due to its ability to carry out disease surveillance, pre-hospital care, mass casualty management, chemical and radiological safety, mental health and risk communication[28].

Primary Health Care stands out for being the first point of access for patients to the provision of health care, providing long-term, person-centered, coordinated and comprehensive care and play a crucial role in resolving inequalities and challenges that arise in provision of health care for vulnerable populations, characteristic of disasters, in addition to the fact that Primary Health Care professionals have an intimate view of patients' lives and needs[30].

Healthcare professionals' participation in all disaster risk management cycles also contributes to achieving the Sustainable Development Objectives, such as ending poverty, zero hunger, health and well-being, climate action, partnerships and means of implementation[31].

The results of this research also demonstrate the importance of offering courses on disasters related to healthcare professionals, considering how these trainings can impact the resilience capacity of these workers when faced with a need for response arising from a catastrophe situation.

Considering the analyzes carried out in this study, it is recommended that healthcare professionals be included in online courses, both in their preparation and also that more courses with multidisciplinary approaches are developed and aimed at them.

The limitation of this study is the difficulty in finding available information, considering that more courses are published in other Latin American countries, but without much information. A complete analysis of these tools could offer a general overview of courses that can be offered to healthcare professionals for their additional training on the subject.

Furthermore, other sectors such as universities and non-governmental organizations also provide courses, but these were not the subject of this research and can be addressed in other studies.

CONCLUSION

The present prospective study reinforces that the use of ICT for distance learning is an alternative, present in both countries, Brazil and Mexico, in terms of additional training for disasters, but not yet specifically aimed at healthcare professionals. In these terms, the need to include this area in the courses offered by official Civil Defense bodies reflects gaps in integration of sectors, with a multi and interdisciplinary approach, in order to promote contingency plans with more coordinated actions, including activities throughout the cycle of these events with serious consequences.

It is worth noting that this research does not intend to exhaust all analyses, and more studies are needed to broaden the view of other actors who also contribute to the training of professionals to respond to risk and disaster situations as well as to expand the analysis to other Latin American countries.

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NOTES

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CONFLICT OF INTEREST

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