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Priscila Meyenberg Cunha Sade

Aida Maris Peres

Ingrid Margareth Voth Lowen

Aline Maria Sampaio Pacheco

Juliana Helena Montezeli

Lívia Cozer Montenegro

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DEVELOPING COMPETENCES IN PUBLIC HEALTH: PROFESSIONAL-MANAGERS' PERCEPTIONS OF THE EFFECTS OF A DISTANCE LEARNING COURSE

ABSTRACT

Introduction: The COVID-19 pandemic has posed challenges to entities responsible for qualifying healthcare professionals worldwide, needing adaptation to offer distance learning courses in the face of implications such as social distancing. However, despite these courses, there are still gaps in understanding their effects. **Objective:** To analyse the feeling of professional managers on the effects of a distance learning course, implemented for the development of public health competencies during the COVID-19 pandemic. **Methodology:** Qualitative research based on data collected from the virtual course environment, which included responses to a question posed to manager-professionals one month after completion: "Which tasks do you routinely perform that have undergone any modification due to your participation in the course?" Data analysis used Descending Hierarchical Classification with the aid of the IRAMUTEQ® *software*, focusing on Simple Segments of Text (SST). SSTs were classified based on their respective vocabularies of higher frequency and words with significant association (p<0.001). Finally, the *software* produced a dendrogram illustrating the hierarchical class scheme. **Results:** 256 responses were processed with a utilization rate of 76.3% of SSTs, resulting in a dendrogram with four classes, revealing modifications in (1) Execution of daily work tasks; (2) Expansion of knowledge about work in the Unified Health System; (3) Coordination between areas for the development of actions in Public Health; (4) Support and guidance for health surveillance actions in collaboration with municipalities. **Final Considerations:** The use of IRAMUTEQ® *software* eased the processing and analysis of a large amount of qualitative data, yielding findings that showed significant changes in the professional practice of managers and, so, a positive impact on the development of public health competencies even during a pandemic.

Keywords
Qualitative research; Distance education; Health management; Public health; Professional Competencies.

1. Introduction

The COVID-19 pandemic has brought unprecedented global challenges to health systems worldwide. In this dynamic and complex scenario, health professionals working in public health management (managerial professionals) have been challenged to mobilize basic and specific skills needed to work in this field (World Health Organization, 2020).

These competencies, which are considered essential public health functions and right for the Region of the Americas, encompass knowledge, skills, and attitudes that are fundamental to decision-making and the effective and efficient resolution of the population's health problems (Pan American Health Organization, 2021). Specifically, knowledge refers to the theoretical and practical understanding of concepts, principles and information (intellectual basis) that guides the actions and decisions of the professional manager; skills correspond to the practical and technical ability to identify possible interventions, select among them the most appropriate and acceptable using the available evidence and develop practical plans to implement them and evaluate their progress; and attitudes refer to characteristics related to collaboration, ethics, adaptability to change and proactive conduct in the face of challenges (Hortelan et al., 2019; Pan American Health Organization, 2021).

It is known that during the challenges of the pandemic, these skills needed to have a high perceived value in public health management, which corresponds to the administration and planning of actions to ensure the right of access to prevention, promotion and health care programs and services (individual and collective), given the responsibility of managerial professionals to manage financial, logistical, and health resources, as well as the workforce of a health system or organization in crisis (Pan American Health Organization, 2021; World Health Organization, 2020). To exercise this responsibility effectively, management professionals need to improve their skills through training and qualification strategies, often achieved through educational actions based on an ethical commitment, from the perspective of building a fairer society (Bornia, Safanelli, & Klaes, 2019).

In Brazil, the entities responsible for training these professionals have had to re-evaluate and adapt their educational strategies, given: the urgency of training; the implications imposed by the pandemic, such as social distancing and isolation measures; and work overload, which made it impossible to hold face-to-face courses (Aquino et al., 2020; Pan American Health Organization, 2020). These strategies required not only technical development but also original approaches to develop competencies in leadership, empathy, and flexibility in record time (Czabanowska & Kuhlmann, 2021).

One of the solutions found and adopted was to expand the use of Information and Communication Technologies (ICT) in the form of Distance Education (DE), considering their unique potential to guarantee the continuity of learning in extraordinary circumstances, such as the COVID-19 pandemic, as well as advantages such as flexibility in terms of time and space and personalized learning options (Tonbuloğlu, 2023). To this end, certain workforce training and qualification organizations had to adapt their course offerings and migrate from the usual face-to-face format to virtual and distance learning formats, while supporting the assumptions of Permanent Health Education (PHE) (Esposti et al., 2020; Krichner, 2020).

It is worth highlighting Poland's experience of features of the organization of distance learning in the process of training specialists in administration and public administration, which pointed out that, in distance learning, one of the important components for efficient learning refers to the correspondence of curriculum content with current trends in professional activity and the relationship between educator and student, in order to guarantee the experience of the content and the quality of the educational process (Sanetra-Półgrabi, 2023).

In Brazil, there is the educational approach known as Permanent Health Education (PHE), approach that is recognized as the most suitable for driving transformations in work practice and in the work contexts of professionals, reinforcing learning on the job, reflection in the context of action, collaboration in teams, and the ability to manage processes. The National PHE Policy supports this approach and already highlighted the strategic role of ICT back in 2009. Therefore, it emphasizes that it is essential to avoid a return to traditional teaching, focusing only on academic courses, far removed from the realities of the workplace (Brasil, 2009; Brasil, 2018).

This transition process - from face-to-face to distance learning, although it has represented a logistical and technical challenge, has allowed professional managers flexibility and openness in accessing knowledge and information, facilitated the formation of national and international virtual communities in areas of interest, overcome problems of distance and access to bibliographies, enhanced the circulation of data and the development of debates and, in general, offered more dynamic, timely and personalized adherence than face-to-face courses (Silva et al., 2020; Souza et al., 2023; Vicente, Santos, & Vieira et al, 2021).

On the other hand, despite distance learning courses and the recognition of their associated benefits and advantages, there are still significant gaps in the production and consolidation of knowledge about their effectiveness. Furthermore, conducting scientific analyses on the perceived effects of these courses can help formulate practical approaches to providing information, feedback, and constant improvement of training and qualification strategies around public health management (Andrade & Zerbini, 2023; Gomes et al., 2020).

In this logic, it is to address a research question such as: What are the feelings of participants in a distance learning course about the impact of the course on the development of the specific skills of management professionals, in a public health context?

Given the above, this study aimed to analyse the feeling of professional managers on the effects of a distance learning course, implemented for the development of public health competencies during the COVID-19 pandemic.

2. Methodology

The qualitative research was based on primary data sources, specifically utilising documents that had not yet undergone content analysis. In other words, these documents had not previously been analysed, systematised, or explored within the context of a research procedure (Sá-Silva, Almeida, & Guindani, 2009; Creswell & Creswell, 2021).

This research took place in the Virtual Learning Environment (VLE) of a School of Public Health, a unit of a State Health Department (SES), found in a state in the south of Brazil, specifically in the Course for Improvement in Essential Skills in Public Health (CIESPH).

This course was held between December 2020 and July 2021 (Chart 1), offered in distance learning mode (with synchronous and asynchronous moments), with the support of 13 tutors and a total workload of 192 hours, targeting professionals who worked in public health management at state/district level, such as administrators, social workers, nurses, pharmacists, doctors, veterinarians, psychologists, nutritionists, occupational therapists - responsible for managing the financial, logistical and health resources and the workforce of a SES, known as managerial professionals.

Chart 1. Timetable for the public health core competencies training course, 2020-2021

DATE	MOMENTS	CH[ł]	PROGRAM CONTENT
07/12/2020	synchronous	2 h	Opening event
07/12/2020 a 03/01/2021	asynchronous	16 h	UA[≠] 1 - International Collective Health and Global Health
04 a 17/01/2021	asynchronous	16 h	UA[≠] 2 - SUS organizational principles and management bodies
18 a 31/01/2021	asynchronous	16 h	UA[≠] 3 - Health Promotion and Social Participation
01/02 a 14/03/2021	asynchronous	32 h	UA[≠] 4 - Health Situation Analysis
15/03 a 14/04/2021	asynchronous	32 h	UA[≠] 5 - Health Care Management
15 e 16/04/2021	synchronous	2 h	Presentation of Part 1 of the Case Study
19/04 a 16/05/2021	asynchronous	32 h	UA[≠] 6 - Health Surveillance
17 a 21/05/2021	synchronous	8 h	Summary report of the outcomes of Part 1 of the Case Study*
24/05 a 27/06/2021	asynchronous	32 h	UA[≠] 7 - Management Functions in Health
28/06 a 01/07/2021	synchronous	2 h	Summary report of the outcomes of Part 2 of the Case Study*
02/07/2021	synchronous	2 h	Closing event

*Remote meetings to be scheduled with tutors. ŧCH - Workload, ≠ UA - Learning Unit

The CIESPH was based on problem cases, with structured and unstructured solutions, questions for reflection and/or consultation of reference texts related to the cases of each UA. These texts had the function of providing theoretical support for solving the problems presented, stimulating the construction of meaningful knowledge for essential public health practices. In this way, the methodologies adopted in the course included discussion, analysis, group production and dialogue on the topics covered.

A crucial aspect of the course involved asynchronous and synchronous components, pivotal for engaging participants remotely while fostering interactive learning experiences. The asynchronous segments, conducted via the VLE platform, eased flexible learning schedules, enabling participants to access course materials and complete preparatory tasks outside scheduled sessions. This approach not only accommodated diverse learning styles but also perfected participant engagement amid logistical challenges posed by the pandemic. The synchronous moment corresponded to a privileged space for harmonizing and combining the teaching-learning process developed in VLE. In response to the pandemic context, synchronous components were conducted with strict adherence to health protocols, using virtual platforms like Zoom to simulate real-time interactions and keep educational continuity while prioritizing participant safety.

It should be noted that the CIESPH was developed based on theoretical and practical application strategies by PHE assumptions, and was configured as an integrated educational strategy, since it met the following criteria: (1) inserted in the social, health, and service context itself, based on the problems of the SES's daily practice; (2) reflective and participatory, aimed at jointly constructing solutions to problems; (3) perennial, in which the various moments and specific modalities were combined into a global development project over time;

(3) oriented towards the development and institutional change of teams and social groups; (4) strategic, in the sense of reaching a diversity of actors (Brasil, 2009; Brasil, 2018).

Therefore, the 13 tutors were strategically assigned to support participants through the VLE, with each tutor responsible for overseeing a cohort of 25 learners. Their responsibilities included easing discussions, offering feedback on assignments, and promoting collaborative learning activities among their assigned groups.

Furthermore, the development and execution of the course involved a multidisciplinary team consisting of 18 educators, 8 curriculum developers, and 5 subject matter experts. This team ensured alignment with educational best practices and the specific requirements of the health sector in Paraná. Their collaborative efforts were essential in refining pedagogical strategies, selecting right learning methodologies, and tailoring content to meet the professional development needs of the course participants.

Of the 313 participants, 256 completed the four CIESPH evaluation instruments and agreed to have their data used for the study. Data collection took place between August and September 2021, considering the data from the open question in one of the instruments was used: "What tasks do you usually perform that have changed in some way as a result of your participation in the course?". This instrument was used to assess the effects of the course on the professional's overall performance, attitudes and motivation to work, considering that it was psychometrically validated and had internal consistency indices considered good or excellent in research carried out for this purpose (Abbad, Zerbini, & Borges-Ferreira, 2012; Andrade & Zerbini, 2023). The answers from the open question were typed into the OpenOffice Writter® program to prepare them for textual analysis (Camargo & Justo, 2013; Camargo & Justo, 2018).

The IRAMUTEQ® software (Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires) was used to support this textual analysis of the responses of the professional-managers who completed the CIESPH. This tool was designed by Pierre Ratinaud and was kept in French until 2009, but now has complete dictionaries in several languages. In Brazil, it began to be used in 2013 for research into social representations. However, other areas have also appropriated its use and contributed to the dissemination of the various possibilities for processing qualitative data, since it allows different forms of statistical analysis of texts, produced from interviews, and documents, among others (Camargo & Justo, 2013; Camargo & Justo, 2018; Souza, Wall, Thuler, Lowen & Peres, 2018).

Six steps were used to analyse the data (Creswell & Creswell, 2021). The first step consisted of organizing and preparing the data for analysis, using the guidelines for creating the textual corpus. The second step involved a complete reading of all the data, with re-readings to evaluate the transcribed content. The third step involved a detailed analysis of the coding process, conducted in the IRAMUTEQ® software, which generated a dictionary of words.

In the fourth step, the coding process was used, with an evaluation of all the classes presented in the dendrogram and new readings of the managerial professionals' responses. The fifth step included contextualizing how the description and themes were represented in the qualitative narrative, based on the literature consulted after the analysis of the categories. Finally, the sixth step involved extracting meaning from the data, followed by the presentation of the results through interpretation based on the literature.

It should be noted that data analysis steps 1 and 2 were conducted by two researchers, while steps 3 to 6 were conducted by three researchers.

The IRAMUTEQ® software offers five types of processing. In this study, the Descending Hierarchical Classification (DHC) processing was used, with the possibility of analysing simple text segments (STS), which is recommended for short answers. In this way, the STS of the textual corpus of the managerial professionals' answers were classified according to the respective most frequent vocabularies and the words with a significant association ($p<0.001$), using chi-square ($\chi 2$). Finally, the software produced a dendrogram illustrating the hierarchical scheme of classes and how they are related.

This research was conducted by the principles of Ethics in Research with Human Beings and was approved by the National Research Ethics Committee of the National Health Council of Brazil, under opinions: 3.242.059 and 3.284.670 (CAAE: 09188519.9.0000.0102 and CAAE: 09188519.9.3001.5225, respectively).

3. Results

The IRAMUTEQ® software processed 256 DHC responses, with 76.34% of the STS being used. A rate of 75% or more is considered an effective use of STS (Camargo & Justo, 2013).

This processing resulted in a dendrogram of four classes (Figure 1), showing the words that had the highest percentage of average frequency between them and those that differed between them. Certain words in the classes are presented in varied sizes, i.e. the larger words are those that are more important in the textual corpus, based on the indicator of frequency greater than 3.84 and $p< 0.0001$.

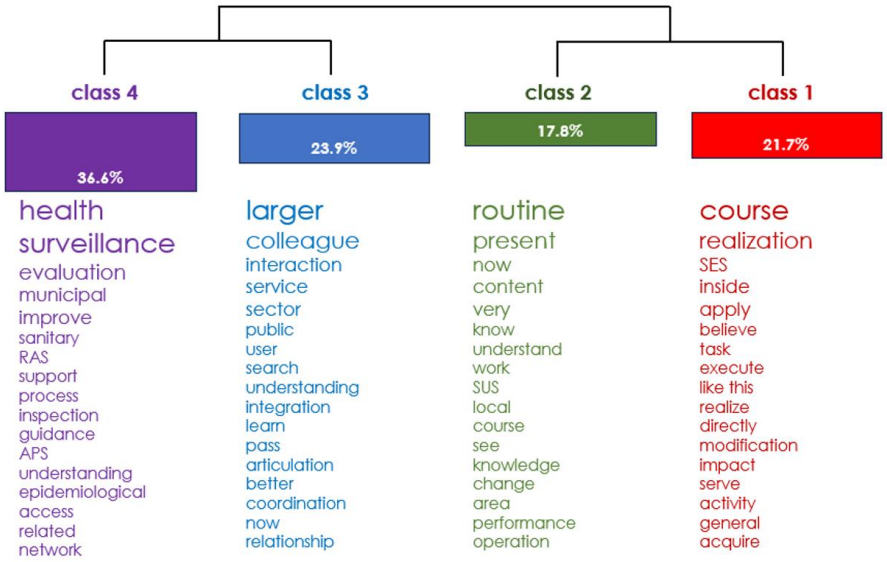


Figure 1. Dendogram with the percentage of STS in each class and words with p<0.001 provided by the IRAMUTEQ® software.

After processing the data, the content analysis of the four classes provided by the IRAMUTEQ® software began, in which the grouped STS were read exhaustively to understand and name each one.

Class 1 refers to changes in the performance of everyday tasks at work. Below are the answers from Professionals 29 and 53 that support this class:

> I can't list the specific tasks, but the whole work process has changed in general. This is because I have learned different skills that permeate my entire practice. This knowledge has changed not only my practice but also my view of different areas of Public Health and the SES, which I didn't understand how they worked before (Professional 29).
>
> Increased attention when receiving medicines, checking expiry dates, faults, and manufacturing batches. Reinforcing the recording of storage temperatures for refrigerated and ambient medicines. Speed up the distribution of medicines to the municipalities (Professional 53).

Class 2 corresponded to Expanding knowledge about working in the Unified Health System (SUS), professionals 17, 27, and 123 stated that CIESPH:

> It improved my feeling of my work process within SUS and SESA. It has helped to visualize SESA as a whole and the process related to SUS (Professional 17).
>
> It broadened my knowledge of the other areas of activity in the SUS and gave me a better understanding of the impacts on my work (Professional 27).
>
> It has changed the way I see the user in the SUS, how I see the situations I come across, and how much I value professional qualifications to perform my job better. I realized how complex public health is (Professional 123).

Class 3, on the other hand, pointed to changes in the articulation between areas for the development of public health actions, showed in the responses of Professionals 101, 190, and 247:

> The interaction with coworkers has given me a new vision of the other sectors of my work (Professional 101).
>
> Approaching, articulating, and discussing with other sectors of the RS. [...]. Greater communication between sectors within the region. Greater participation and interest in intersectoral activities aimed at providing better care for SUS users (Professional 190).
>
> I learned how important it is for the sectors to be aligned to improve the quality of the health service provided, which will be reflected in the general population that uses the health services (Professional 247).

Finally, in *Class 4*, Professionals 71, 115, and 137 reported on support and guidance for health surveillance actions in the municipalities:

> I work in Primary Health Care, and the course was especially useful for us to think more about flows and guidelines for the municipalities, always aiming to improve care for the population (Professional 71).
>
> Support for municipalities about the role of management and the Health Care Network (Professional 115).
>
> Health inspection, evaluation of hospital infection rates, planning of health surveillance actions, training for hospitals, and municipal health surveillance (Professional 137).

It is worth noting that it was possible to find relationships between the first and second grades and between the third and fourth. These relationships show the specific development of the knowledge, attitudes, and skills components, respectively.

4. Discussion

Class 1 showed changes in relation to the tasks performed daily by health professionals because of their participation in the course, which corresponded to improvements in planning and organizing strategies in the work environment. This is based on finding the health system user's needs with the aim of achieving quality care that promotes comprehensive and individualized help (Soder et al., 2020).

Class 2, on the other hand, showed an increase in knowledge about the work process in the Unified Health System (SUS), corroborating another study that sought to understand the conceptions of 50 professionals from the management and services of this system, in a municipality in Southeast Brazil, about Permanent Health Education (EPS) actions. This study pointed to potentialities presented by the participants in this research that were highlighted: the expansion of the resoluteness of the services, improvements in the organization of work processes, the increase in the safety of workers in meeting the needs of the population (Iglesias et al., 2023).

Classes 1 and 2 are related and when analysed from the perspective of the definition of competencies, they corroborate the components of knowledge - the intellectual basis that guides the professional's actions and decisions - and attitude - behaviour. Both classes revealed not only a gain in knowledge but also changes in attitude among the professionals taking part in the distance learning course. This duality suggests that the effect of the course goes beyond the simple acquisition of information, permeating the behavioural and attitudinal sphere of managerial professionals (Almeida et al., 2017; Hortelan et al., 2019).

In addition, this relationship reinforces that professional managers, regardless of their context in public health, must consider: care, which refers to interventions related to the health-disease process; research, which implies the evidence that permeates the care process, based on continuing education; and management, which coordinates activities related to the organization of work through leadership and active participation (Weber et al., 2020).

Class 3 reflected changes in the interdisciplinary and inter-institutional approach, highlighting the importance of collaboration between different sectors and public entities. The central aim was to broaden the scope of the care offered, promoting a more integrated and comprehensive approach to the social determinants of health. The emphasis on responsibility and problem-solving highlighted the search for effective and sustainable solutions, contributing to improving the health conditions of the population served (Arcari et al., 2020).

As for Class 4, it found changes in the development of actions aimed at social determinants, revealing a commitment to dealing not only with the clinical manifestations of health conditions but also with the social factors that directly influenced decision-making for the well-being of the population. In this sense, collaboration between sectors and public entities has become essential to face the challenges posed by the COVID-19 pandemic and promote positive changes in the population's health conditions (Mendonça et al., 2023).

The improvement of management and healthcare activities is related to the knowledge bought about other health services, which is applied in a practical way to specific workflows. This knowledge with practical applicability came about through the participation of the managerial professionals in the course, corroborating the findings of an integrative literature review on educational offers under the logic of PHE, as a tool to enable changes in work organization, care models and health conceptions, allowing workers to develop autonomy and increase technical and relational skills (Pralon, Garcia, & Iglesias, 2021).

As for the relationship established between Classes 3 and 4, together they point to the development of the skill component - the practical and technical capacity to carry out specific tasks, since they reflect, from the knowledge acquired during CIESPH, more effective applicability in the form of interaction in their respective areas of activity and the execution of actions related to planning, inspection, and evaluation in public health, for example.

Thus, they outline a perspective that encompasses everything from intersectoral collaboration to strengthening health surveillance actions. This reinforces the imperative of integration between areas/sectors to achieve effective results in health care and in responding to complex situations. This correlation combines a more effective approach to public health management, emphasizing the importance of synergies and integrated strategies for the benefit of the SUS user population (Castro et al., 2019; Arcari et al., 2020).

Considering this, it is possible to infer that, considering the integrated and interdependent approach of knowledge, skills, and attitude, CIESPH has contributed positively to the development of managerial professionals' competencies, producing significant effects for facing the challenges posed by the COVID-19 pandemic. This inference is in line with a scoping review that points to the importance of developing educational actions for managerial professionals since it listed studies that allowed the mobilization of skills for decision-making in public administration, governance, planning, health care, and the implementation of public health policies (Souza et al., 2023).

This review highlights the need to target educational measures specifically at managerial professionals, specifically addressing issues related to the environment conducive to gender, equity, and socioeconomic factors, as well as the organizational environment, focused on reorganizing the responsibilities of these professionals. In addition, the COVID-19 pandemic has amplified social and economic disparities, both gender and organizational, highlighting the need for managerial professionals to be aware of these issues and take these aspects into account in their decisions and actions (Souza et al., 2023).

As a limitation, the report extracted with the data from the open responses of the professional-managers was not linked to the socio-demographic data, which is a restriction of the CACESP VLE system, and consequently did not allow the identification of the profile and differentiation of the professional categories. This information would have enriched the analysis. However, considering the authenticity and reliability of the data in this report, together with the use of IRAMUTEQ® software, this resource appears as a consistent method for achieving the aim of this research.

5. Final considerations

The use of IRAMUTEQ® software eased the processing and analysis of a large amount of qualitative data. The dendrogram resulting from this processing highlighted four classes with correlations, which revealed perceptions that pointed to substantial changes in the execution of tasks, increased knowledge about the SUS, changes in the articulation between areas for the development of public health actions and support and guidance for health surveillance actions in the municipalities.

The relationship between Classes 1 and 2, when analysed in the light of the definition of competencies, underscored the crucial interconnection between knowledge and attitude. The managerial professionals who taken part in the CIESPH course not only bought theoretical knowledge but also showed attitudinal changes, saying an initiative-taking application of the newly bought knowledge. This outcome reinforced the dynamic and interdependent nature of competencies, highlighting that true competency development extends beyond mere information acquisition to include significant behavioural and attitudinal transformations.

The relationship between Classes 3 and 4 pointed out that practical skills, when applied together, combine a more effective approach to public health management, reinforcing the importance of integration between areas/sectors and the constructive interaction of integrated strategies for the benefit of the SUS user population.

Therefore, it can be inferred that CIESPH has contributed significantly to the development of managerial professionals' skills, enabling them to face the complex challenges of public health management, producing lasting positive effects even in challenging circumstances such as those faced during the pandemic. The effects of this distance learning course have transcended adversity, combining this type of course as a powerful resource for developing essential skills in managerial professionals. Additionally, it is noteworthy that the qualitative nature of these data also offered valuable insights for the continuous improvement of the course.

The exploratory nature of this study provides a starting point for future, more in-depth studies. In the context of professional training, distance learning course courses can significantly affect the acquisition of skills and so improve performance. This study contributes to qualitative methodologies by proving how open-ended questions and thematic analysis can reveal nuanced changes in professional behaviour and attitudes following targeted educational interventions.

Future research could delve deeper into specific areas, addressing questions such as: What specific skills should be developed to improve managers' performance? Additionally, further studies could explore the long-term effects of such training programs and the mechanisms through which these skills are applied in the workplace. This will help in refining educational strategies and enhancing the effectiveness of distance learning course training programs for managerial professionals.

Finally, we reiterate the need to consider the assumptions of PHE as a fundamental strategy for transforming professional practices. This transformation is necessary both in the internal context of the work process and in response to the daily challenges of public health management. PHE with ICT appears as an essential approach in the search for innovations and technological solutions, not only to face the challenges arising from health crises but also to deal with the daily demands of public health management.

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Priscila Meyenberg Cunha Sade
Federal University of Paraná, Brazil
https://orcid.org/0000-0001-5021-5147
✉ priscila.sade@gmail.com

Aida Maris Peres
Federal University of Paraná, Brazil
https://orcid.org/0000-0003-2913-2851
✉ aidamaris.peres@gmail.com

Ingrid Margareth Voth Lowen
Federal University of Paraná, Brazil
https://orcid.org/0000-0001-5758-9512
✉ pilowen@gmail.com

Aline Maria Sampaio Pacheco
Federal University of Paraná, Brazil
https://orcid.org/0009-0002-5209-6043
✉ allinesampaioufpr@gmail.com

Juliana Helena Montezeli
State University of Londrina, Brazil
https://orcid.org/0000-0003-4522-9426
✉ jhmontezeli@hotmail.com

Lívia Cozer Montenegro
Federal University of Paraná, Brazil
https://orcid.org/0000-0003-3216-1645
✉ liviacozermontenegro@gmail.com