

Original Research

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Ready or Not? The Emergency Preparedness State-of-art Among Italian Public Health Medical Residents

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Abstract

Objectives: Italy often experiences major events, such as earthquakes, floods, and migrant shipwrecks. Current and future global challenges for health workers are made up by climate change, pandemics, and wars. In this work, we will assess the state-of-art of training and interest towards these challenges among Italian post-degree public health schools.

Methods: A cross-sectional survey was conducted in Italy in June 2023 among Italian public health residents. The study investigated training levels and updates regarding emergencies in Italian residencies. It also analyzed interest and importance of topic, impact of the COVID-19 pandemic, and sources of information.

Results: Of 289 respondents, 86.2% deemed the topic important and 74.4% expressed interest. 90.1% pointed out the lack of dedicated courses and 93.1% of specialized master’s programs. Perceived importance in the topic was associated with the desire to attend dedicated conferences. As for COVID-19, 24.6% recognized the importance of this topic pre-pandemic, while 50.9% raised awareness during the pandemic.

Conclusions: This survey shows the need for the offer of emergency training programs in Italian public health schools. Professionals in public health can make a great contribution to emergencies, not only in preparedness, but also in response and recovery phases.

Disaster medicine integrates multiple disciplines to maintain health services and reduce health impacts before and after disasters, as guided by the Sendai Framework for Disaster Risk Reduction.¹ Disaster medicine aims to reduce casualties and strengthen infrastructure despite systematization challenges and slow progress.² It anticipates rapid institutional and academic advancements in the coming decades.³ These advancements are expected to be particularly significant in the field of education.⁴

Public health professionals have a primary role in response and preparedness to emergencies. They manage disease prevention and control, especially the mitigation of outbreak risk during crises. Assessing health risks and implementing effective public health interventions could reduce morbidity and mortality among affected populations.⁵ Furthermore, public health professionals could collaborate with government agencies, NGOs, and local communities to ensure an integrated response approach, meeting specific needs of affected populations. This would improve the effectiveness of interventions and promote community resilience.

Benefits of disaster preparedness for healthcare professionals are widely underscored, advocating for wider team inclusion and emphasizing real-time evaluations and validated tools to refine preparedness practices.⁶ The impact of natural events and the consequences of uncontrolled anthropization in certain regions of the planet highlight the urgent need to integrate disaster medicine, the specialized field of medical practice focused on the planning, management,

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and delivery of health care services during natural or human-made disasters, and Public Health Emergency Preparedness (PHEP), defined in the literature as “the capability of the public health and health care systems, communities, and individuals, to prevent, protect against, quickly respond to, and recover from health emergencies, particularly those whose scale, timing, or unpredictability threatens to overwhelm routine capabilities.”⁷ This may be obtained by developing competence standards, health professional certification, dedicated research organizations, and quality assurance in disaster response. From this perspective, public health can be considered an essential component of disaster medicine, encompassing all the dimensions (medical, social, political, and economical) that could be affected by a single event.

Post-Hurricane Katrina, the American Medical Association formulated an educational framework and competencies for diverse health professionals, emphasizing the need for ongoing refinement and recognizing preparedness as a continuous process.⁸ After Hurricanes Florence and Dorian, public health leadership faced major disruptions within emergency operation centers, with the establishment of shelters for staff, particularly for nurses, being a major challenge local health authorities.⁹

Recent epidemics underscore the health, economic, and political fallout of global unpreparedness, stressing the importance of collaboration, community involvement, and resilient health systems for future threat mitigation.¹⁰ Climate change may affect human health directly through extreme weather and disease incidence, and indirectly via agricultural disruption, nutritional losses, occupational hazards, mental health issues, and its contribution to mass migration, conflict, and violence.¹¹ Decades of focus on conflicts and crises present an opportunity to innovate in public health through improved education, training, and policy, advocating for a global response where public health as a strategic security issue surpasses political agendas, emphasizing community well-being.¹²

The definition of PHEP sometimes obscures the assessment of national readiness for bioterrorism or outbreaks, yet it sets a vision for prepared communities, informs stakeholder dialogue, and supports the development of standards under the 2006 Pandemic and All-Hazards Preparedness Act to ensure public health system readiness.⁷ Global preparedness for biological threats requires specific strategies (e.g., China’s biosafety measures), highlighting the need for more research funding and international cooperation to improve biosafety and biosecurity and facilitate crucial worldwide dialogue.¹³ An empirically based, ethics-focused complex adaptive systems framework for PHEP has emerged, offering a novel approach to define and enhance upstream readiness for local health authorities through qualitative research in Canada.¹⁴

Crisis risk communication is also essential, merging insights from various fields to assess curricula and training; despite progress in its integration into public health, there is a lack of thorough evaluation of its effectiveness in specific events.¹⁵ Enhancing health system coordination and public engagement can be achieved by developing communication infrastructure, adopting advanced equipment, and leveraging diverse communication methods and artificial intelligence.¹⁶

Emergency management skills span engineering, military, and health care fields, with efforts to integrate public health skills into resuscitation training; yet, similar approaches in training public health professionals remain unexplored in the literature.¹⁷ In the EU, the competency model for PHEP standardizes and guides training while ensuring consistent PHEP approaches across member states.¹⁸ A framework from the European Centre for Disease Prevention and Control (ECDC) offers a detailed blueprint for

evaluating public health emergency preparedness across European nations, with capabilities spanning 5 key areas for effective emergency response, enabling streamlined comparisons and facilitating collaborative improvement efforts in preparedness.¹⁹

In the US, emergency training offerings are limited and unevenly distributed among Council on Education for Public Health public health schools, mainly in the form of postgraduate certificates.²⁰

We wanted to explore training offerings in Italy in relation to public health medical schools. In this sense, we investigated whether it was possible to compare data found in the literature with data resulting from the study.

In relation to emergency training, the perceived and expressed training need, the sources of information chosen, and the level of competence already possessed were investigated. Italy’s vulnerability to major events - mostly earthquakes and floods - underscores the need for enhanced preparedness and professional competency in emergency response. To date, a Peer-Assisted Learning (PAL) program in disaster medicine for undergraduate medical students in Italy has expanded across medical schools, boosting knowledge and satisfaction, and advocating for global integration of disaster medicine into standard medical education.²¹

On this basis, the aim of this study is to investigate the presence of specific training on emergencies in graduate schools of Hygiene and Preventive Medicine in Italy, as well as to explore attitudes toward these issues.

Methods

Participants and Aim

This project was based on a cross-sectional online survey, distributed among all Italian Public Health residents affiliated with the Italian Society of Hygiene and Public Health (SIItI), from June 16-June 30, 2023.

The main fields to investigate were the presence of training and updates in emergencies and the level of interest and perceived importance of the topic regarding the impact of the COVID-19 pandemic.

Data Collection

Respondents were assured of their anonymity and no identifiable information was collected, ensuring that responses could not be traced back to any participant. The dataset is stored in a protected cloud account and will be retained for a limited period; it is managed by the research group’s team, ensuring that only authorized personnel can access the data. Given the nature of this survey, which involved minimal risk to participants and did not collect sensitive personal information, ethical committee approval and any formal ethics submission was deemed unnecessary.

Questionnaire (Google Form)

The survey was organized on the Google Forms platform and administered by email with the cooperation of the SIItI Residents’ Council representatives. The results were collected anonymously in a Google Sheet dataset. Despite the anonymity, the data were stored in an account dedicated to the project, whose password is held only by the board and will be retired 2 years after collection.

The first 10 questions were retrieved by a previous survey conducted in 2019 by the “Emergencies in Public Health” Working Group.²² Considering that the COVID-19 pandemic took place

between the 2 studies, we added 2 questions (n.11 and n.12) about the respondents' attitude toward the pandemic (i.e., whether it changed their interest in emergency prevention and management and whether they took an active part in the pandemic response). Detailed questions, related variables, and scores are listed in Table 1.

At the time of the study, 41 post-graduate schools in public health were surveyed, located in 17 Italian regions, and 885 trainees were enrolled in the SItI, as recorded in the national membership register.

Estimating a 95% confidence interval and a margin of error of 5%, the minimum sample size was set at 268 responses.

Statistical Analysis

The first step of data analysis involved an examination of individual responses through the calculation of frequencies, using both STATA® and R®, allowing the team to gain a widespread understanding of distribution of responses among the data. Moving beyond univariate analyses, we delved into exploring relationships between different variables. Correlation analysis played a key role with the calculation of Spearman's coefficients. By employing this nonparametric measure of correlation, we were

able to quantify associations between pairs of quantitative variables. Analysis integrated different statistical methods like regressions and non-parametric tests. This strategy aimed to find patterns, correlations, and dependencies among the data to understand their structure and dynamics. Contingency tables were set up to discover the interplay among variables and facilitate the search for associations between different categories. Linear regression was used to discover relationships between dependent continuous variables and independent variables. Logistic regression was employed to check relationships between a binary variable and its eventual predictors, highlighting potential factors influencing categorical outcomes. The 2-sample Wilcoxon rank-sum test (Mann-Whitney *U* test) was used to bypass limits of non-response to parametric assumptions. This allowed the assessment of significant differences between independent variables (calculating *P* value), providing an alternative to traditional *t* tests.

Results

A total of 289 forms were filled, with a 32.66% response rate among residents enrolled in SItI at that time, meeting the minimum sample size established in the study design process.

Table 1. List of questions and related variables and scores

#	Text	Variable name	Type	Score
1	"Location"	zona	Categorical	N/A (textual)
2	"Have you ever attended courses on public health emergency management?"	freqcor	Dichotomous	0/1
3	"Does your school have a course on public health emergency management as part of its curriculum?"	prescor	Dichotomous	0/1
4	"Are there any master's courses on public health emergency management at your university?"	presmast	Dichotomous	0/1
5	"On a scale of 1 to 5 (where 1 is not at all and 5 is very much), how important do you consider the presence of a teaching of public health emergency management during the specialisation course in Hygiene and Preventive Medicine to be?"	qimp	Continuous	1–5
6	"On a scale of 1 to 5 (where 1 is not at all and 5 is very much), what is your interest in the knowledge/management of public health emergencies?"	qinter	Continuous	1–5
7	"Where do you look for information on public health emergency management?"	fontpub fontprot fontlez fontblog fontcongr fontriv fontsoc	Multiple choice	0/1 for each one
8	"On a scale of 1 to 5 (where 1 is not at all and 5 is very much), would you be interested in taking part in simulations, workshops and training events related to public health emergency management?"	corsint	Continuous	1–5
9	"Do you believe there is a satisfactory training network for trainees in public health emergency management?"	rete	Dichotomous	0/1
10	"Please indicate which of the following items you feel you know"	condiff conpei conmau conmag conics	Multiple choice	0/1 for each one
11	"How do you feel that the COVID–19 pandemic has changed your need for training in public health emergency management?"	panint	Continuous	0–2
12	"Did you actively participate in the pandemic emergency response?"	panatt	Dichotomous	0/1
	Sum of answer to question #7	fontsonna	Continuous	0–7
	Sum of answer to question #10	consomma	Continuous	0–5

Distribution of Responses

Speaking of Italian macro-areas, the analysis reveals that most responses are slightly concentrated in Northern Italy, accounting for 35.29% of responses and featuring post-graduate schools in the regions of Piedmont, Aosta Valley, Lombardy, Veneto, Emilia-Romagna, Friuli-Venezia Giulia, Liguria, and Trentino-Alto Adige. With 31.14% of responses, the Central zone includes schools in the regions of Lazio, Tuscany, Umbria, and Marche. The Southern and Islands contributed 33.56% of the responses and involves schools located in southern regions and islands, such as Abruzzo, Molise, Campania, Calabria, Apulia, Basilicata, Sicily, and Sardinia.

In terms of regions (Figure 1), Umbria reported 19 responses, Tuscany had 47 responses from 3 universities (averaging 15.67 responses per school), Liguria contributed 10, Sardinia accounted for 19 responses across 2 universities (averaging 9.5 responses per school), and Piedmont had 18 responses from 2 universities (averaging 9.0 responses per school). Perugia, Pisa and Palermo Universities each stand out with 19 responses (6.57%). This is followed by a strong presence for the venues of University of Naples Federico II and University of Siena, each with 17 responses (5.88%).

Participants' Background

Most respondents (69.55%) did not attend courses related to emergency management in public health (variable "freqcor"). The remaining 30.45% said they had attended such courses. We investigated which were the main sources of information consulted by the respondents by using a multiple-choice question (more than 1 answer was allowed). The survey shows that 54.67% of respondents rely on official protocols, 51.90% attend thematic events, and 43.94% of respondents use PubMed and similar search engines. A smaller percentage inform themselves through online blogs (16.96%), by reading scientific journals (16.96%), or through scientific societies (28.03%). An analysis of the combination of responses showed that 25.61% use only 1 source of information, 29.07% use 2 sources, and 23.88% use 3 sources. Only 1.04% of respondents use 6 or 7 sources of information.

When analyzing the background knowledge in public health emergency issues, it was found that 53.98% can recognize the difference between an "ordinary" emergency and a public health emergency. PEMAFA, an Italian hospital emergency plan for a massive afflux of casualties, is known by only 24.57% of respondents; 11.42%

region	n responses	n schools	average by school
Umbria	19	1	19,00
Tuscany	47	3	15,67
Liguria	10	1	10,00
Sardinia	19	2	9,50
Piedmont	18	2	9,00
Sicily	26	3	8,67
Veneto	16	2	8,00
Abruzzo	16	2	8,00
Apulia	14	2	7,00
Campania	19	3	6,33
Emilia-Romagna	23	4	5,75
Lazio	23	4	5,75
Lombardy	32	7	4,57
Calabria	3	1	3,00
Friuli-Venezia Giulia	3	2	1,50
Marche	1	1	1,00
Molise	0	1	-
Aosta Valley	0	0	-
Trentino-Alto Adige	0	0	-
Basilicata	0	0	-



Created with Datawrapper

Figure 1. Distribution of respondents per school per region

are familiar with Maurer’s Table and its applications. The ability to manage an emergency warehouse was reported by only 12.46%, and only 13.15% know what an ICS or H-ICS is.

Again, this was a multiple choice question (1-5 items), and analysis of the combination of responses showed that 36.33% of respondents had never been familiar with any of the topics mentioned. 35.99% had knowledge in only 1 of the listed items, but the percentage dropped to 2 topics (14.88%) and only 4.15% knew all of them.

Interests and Priorities

On a scale of 1-5 – where 1 is “not at all” and 5 is “very much” – 51.21% of respondents gave the highest score to the importance of teaching in emergency prevention and management. This is followed by a significant 34.95% of respondents who gave a score of 4 and 10.73% who gave a score of 3. The other scores (1 and 2) have lower percentages (1.04% and 2.08%, respectively). For this variable, the average value was 4.20 with a standard deviation (SD) of 0.88 (CI 95% = 4.39-4.21).

The analysis of interest in public health emergency knowledge also reveals a prevalence of the highest scores, with 38.75% giving a score of 5 and 35.64% giving a score of 4. 18.34% gave a score of 3, and scores of 1 and 2 and lower (2.42% and 4.84%, respectively). The average was 4.07 and the SD was 0.99 (CI 95% = 4.17-3.96).

We found the same pattern for the analysis of interest in participating in simulations, workshops, and training events related to public health emergency management, where 40.48% of the residents gave a score of 5, and 30.45% gave a score of 4. A score of 2 was found in 5.19% of the responses and a score of 1 in only 3.46%. The average value was 4.05 and SD was 1.08 (CI 95% = 4.16-3.94; Figure 2).

Training Offered by Universities

The various university educational offerings were evaluated on the presence of specific courses, master’s degrees, and educational networks in public health emergencies.

Of the 289 total respondents, only 27 (9.34%, $P < 0.001$) referred to the presence of specific courses on emergency prevention and management in their residency. In addition, 20 respondents (6.92%, $P < 0.001$) reported the presence of masters in this area in their university (even outside of their post-graduate school). 38

respondents (13.15%) reported an adequate training network focused on the area of emergency management within their schools (Figure 3).

COVID-19 Pandemic Effects

67.82% of the residents enrolled agreed that the COVID-19 pandemic increased their need for training on emergency prevention and management; 29.07% said this need was also present before and remained unchanged, while only 3.11% said they were not affected either before or after the pandemic.

In addition, 86.85% of residents actively participated in the pandemic emergency response, and only the remaining 13.15% said they did not. The examples considered were internships in local public health departments, vaccinations, health surveillance for workers, USCA, contact tracing, school medicine, clinical activity in COVID-19 hospital wards, military medicine, etc.

Associations Within Different Variables

Spearman’s correlation coefficient ($t = 0.5223$) with high statistical significance ($P < 0.01$) was calculated between the variable related to the importance of public health emergency management teaching and the variable regarding interest in taking part in simulations, workshops, and training.

A correlation, albeit weak, was found between the importance of public health emergency management teaching and the number of sources of information used, where $t = 0.2045$, and $P < 0.01$.

On the other hand, the correlation between “qimp” (importance of emergency management teaching and sum of basic knowledge) is very weak ($t = 0.1155$), but still shows statistical significance ($P = 0.05$).

Combining the question on the presence of courses and the question on lectures as a source of information (in a range from 0:0 to 1:1), it was seen that the 0:0 combination prevailed for the majority, namely the absence of both courses and lectures, with a total of 237 responses (82.00%). The 1:1 combination was represented by only 13 responses (4.50%), with significant variability among the different home schools ($P < 0.01$).

A correlation matrix was created by merging the variables regarding effects of the COVID-19 pandemic on interest and past experience, in a ratio ranging from 0:0 to 1:2. A total of 57.76%

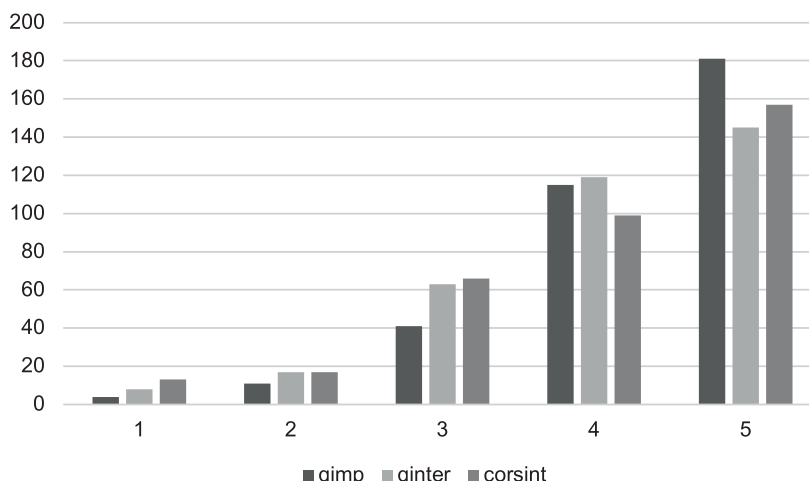


Figure 2. Scores for perceived importance of topic (“qimp”), interest in general knowledge (“qinter”) e and interest in attending courses (“corsint”)

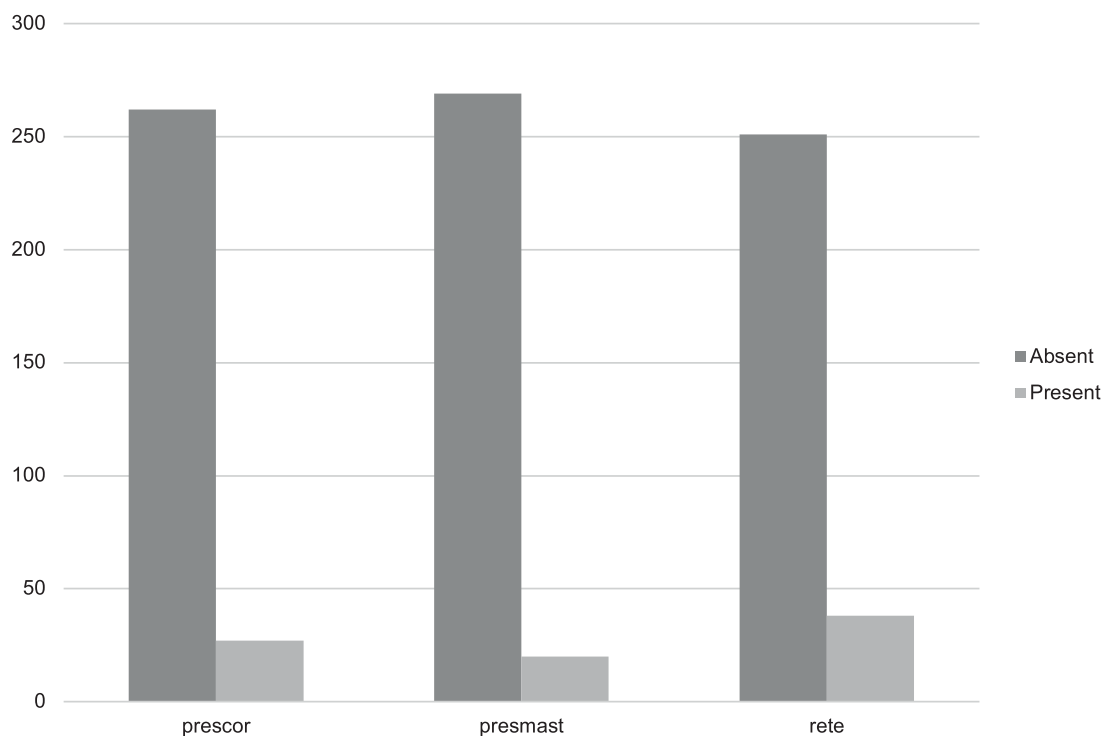


Figure 3. Number of responses on presence of courses (“prescor”), masters (“presmast”) and training network (“rete”)

Table 2. Perceived importance and general interest in topic, linked to pandemic involvement. In columns are merged the two COVID-19 variables, namely the participation to pandemic response and the change in need for training, in a ratio from 0:0 to 1:2.

“Did you actively participate in the pandemic emergency response?” ; “How do you feel that the COVID-19 pandemic has changed your need for training in public health emergency management?”								
	Overall	0;0	1;0	0;1	1;1	0;2	1;2	<i>p</i> test
<i>n</i>	289	4	5	9	75	25	171	
“On a scale of 1 to 5 (where 1 is ‘not at all’ and 5 is ‘very much’), how important do you consider the presence of a teaching of public health emergency management during the specialization course in Hygiene and Preventive Medicine to be?”								<0.001
1	3 (1.0)	0 (0.0)	2 (40.0)	0 (0.0)	1 (1.3)	0 (0.0)	0 (0.0)	
2	6 (2.1)	1 (25.0)	0 (0.0)	0 (0.0)	1 (1.3)	2 (8.0)	2 (1.2)	
3	31 (10.7)	1 (25.0)	3 (60.0)	0 (0.0)	2 (2.7)	3 (12.0)	22 (12.9)	
4	101 (34.9)	1 (25.0)	0 (0.0)	2 (22.2)	28 (37.3)	8 (32.0)	62 (36.3)	
5	148 (51.2)	1 (25.0)	0 (0.0)	7 (77.8)	43 (57.3)	12 (48.0)	85 (49.7)	
“On a scale of 1 to 5 (where 1 is ‘not at all’ and 5 is ‘very much’), what is your interest in the knowledge/ management of public health emergencies?”								<0.001
1	7 (2.4)	1 (25.0)	2 (40.0)	0 (0.0)	1 (1.3)	0 (0.0)	3 (1.8)	
2	14 (4.8)	1 (25.0)	3 (60.0)	0 (0.0)	1 (1.3)	3 (12.0)	6 (3.5)	
3	53 (18.3)	1 (25.0)	0 (0.0)	0 (0.0)	8 (10.7)	3 (12.0)	41 (24.0)	
4	103 (35.6)	0 (0.0)	0 (0.0)	4 (44.4)	27 (36.0)	7 (28.0)	65 (38.0)	
5	112 (38.8)	1 (25.0)	0 (0.0)	5 (55.6)	38 (50.7)	12 (48.0)	56 (32.7)	

people who gave a result of 0:2 (increased need for training without participating in the pandemic response) or 1:2 (increased need for training and participated in the pandemic response) gave a score of 4 or 5 to the perceived importance of the topic. The same occurred

regarding interest in the topic, with 48.44% ($P < 0.001$). Detailed results are in Table 2.

Similarly, we put together the perception of importance and interest in taking courses, finding that those who gave scores of 4-5

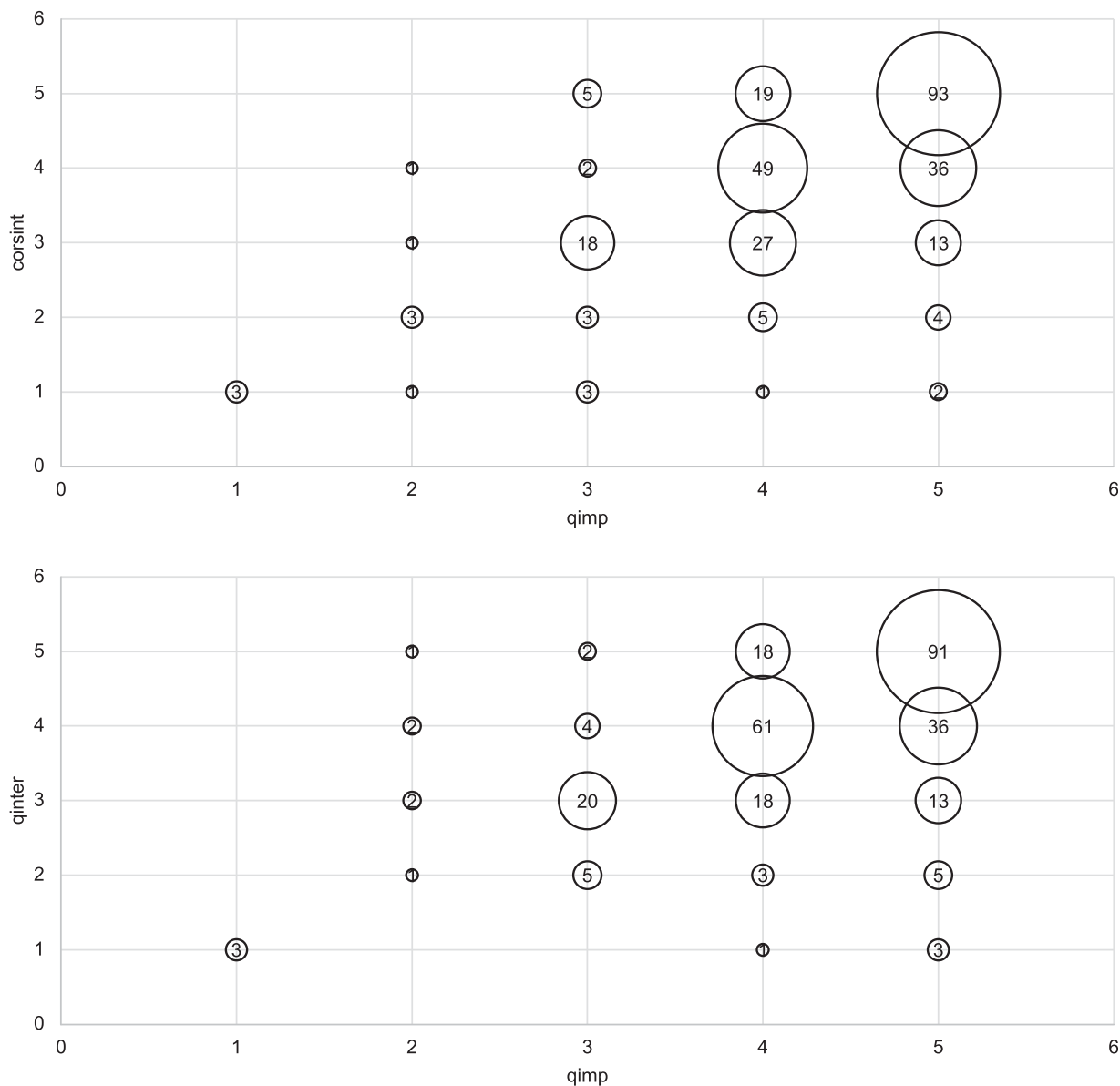


Figure 4. Combinations of scores of perceived importance (“qimp”) and interest in attending courses (“corsint”) - Combinations of scores of perceived importance (“qimp”) and general interest in topic (“qinter”).

to both questions were a total of 197 (68.17%, $P < 0.001$, Figure 4a). As for the association between perceived importance and interest in the topic, the total number of people who gave 4-5 to both variables was 206 (71.28%, $P < 0.001$, Figure 4b).

Discussion

Most respondents lack specific training in public health emergency management, using mainly official protocols and thematic events as sources of information, with varying knowledge bases on the principles of public health emergencies. Residents highly valued the importance of this topic and showed a strong interest in teaching and participating in public health emergency prevention and management, despite a low presence of specific courses and master’s degrees in universities. Active participation in the COVID-19 pandemic response was high among participants, and the correlation between the relevance of the topic and actual interest in participating in simulations and trainings is noteworthy.

The results highlight the need for a standardized and broad training approach for prevention and management of public health emergencies in Italian medical education because a strong demand surged for practical and theoretical training among trainees with a high level of interest.

Data showed consistency with international and national research regarding training in public health emergencies and disaster medicine. Emergency training in the US is confined essentially to post graduate certificates, underscoring a significant gap in students’ preparation for public health emergencies.²³ Also, in Italy, there is a need for targeted training to improve professional expertise, coordination, and integration between first responders and public health professionals. There is evidence of interest in integrating these courses into the standard medical curriculum, highlighting a recognition of their value for the future of the profession,²⁴ consistent with the interest shown by residents in our analysis of practical and theoretical events related to public health emergencies.

Despite the study limitations described in the following section, the data collected highlight a strong call for action to improve educational resources in the field of public health emergencies and increase the resilience and adaptability of future public health professionals.

Survey results pose challenges for universities, policymakers, scientific societies, and civil society. Shared commitment is needed to integrate training curricula, allocate resources for training, and promote effective collaboration among various entities. In this manner, a significant improvement in the management of future health crises could arise, benefiting the entire community.

The link between training in public health emergency management and studies on pandemic preparedness, epidemic intelligence, and public health management during mass events is intrinsically linked to the future role of hygienists in emergency prevention. These areas represent concrete examples of the challenges that future hygienists will face, requiring effective practical preparation in resource management during emergencies and in analyzing the short-, medium-, and long-term consequences of major events. These consequences include not only diseases related to direct exposure to events, but also long-term issues such as vaccination-preventable diseases, hygiene and disinfection issues, and the management of displaced persons and forced migration. In addition, the areas of study extend to issues of global significance such as climate change, wars, and migration, which are increasingly at the center of public health discussions. Approaching these different aspects of public health not only broadens the understanding of global health threats, but also guides toward the development of proactive, interdisciplinary strategies that prepare public health professionals to respond competently and strongly to a wide variety of emergency scenarios, highlighting the importance of training that is as broad as it is in-depth.

Public health professionals in Italy who responded to this survey demonstrated the need to implement skills regarding the management of critical emergency events. The demand to integrate specific skills into public health training courses addresses the need to train professionals who can better contribute to emergency management. A response to this educational need is necessary, not only due to the importance of the global training of public health professionals, but also to guarantee the contribution of public health in the management of major emergency events.^{25,26}

Limitations

While achieving statistical significance, the study encounters limitations in its representation and scope that may affect the generalizability of its findings. Although all Italian Public Health post-graduate schools are represented, the numerical contribution of responses varies significantly, potentially skewing the perceived realities of universities.

Moreover, the geographic adherence of respondents could be influenced by the historical context of the areas in which their respective schools are located (i.e., areas that have recently suffered from a medical emergency incident, and the residents' personal lived experiences may have influenced survey participation and willingness to take courses and improve the subject). However, no relevant patterns were evident in this sense.

Similarly, the objectivity of data collected is complicated by the subjective nature of the responses. Perceptions of importance and interest may unavoidably be influenced by participants' individual

background and experiences, thereby introducing a level of bias that must be acknowledged when interpreting the results.

Another bias may be induced by all non-respondents' attitudes, whereas they may not be affected by the topic nor are they interested in it. A larger sample of respondents may increase accuracy of data obtained.

Another limitation was given by the lack of detailed numbers of public health residents enrolled in SItI, while only a cumulative number was provided by the society (as shown in the methods). In this case, our team was not able to calculate a detailed response rate divided by universities and regions.

Conclusions

This study advocates evidence-based interventions to address knowledge gaps in emergency prevention and management in public health. The relevance of a resilient health system highlights the urge to standardize training and align education with identified needs.

Improving education in emergency prevention and management within public health residency programs is essential, for example, through conventions, lectures, and formal courses. The organization of specialized courses and master's programs presents a major challenge, as well as integrating educational plans with the educational network.

Following the insights on interest in the topic, bottom-up advocacy would ensure a participatory and proactive approach by young public health professionals. By demonstrating their needs, trainees can contribute to the improvement of their own public health emergency training and the development of courses and activities that respond more directly and appropriately to the real needs of the field.

Given the recent major events that have happened in Italy such as floods in Emilia-Romagna, the bradyseism in the Phlegraean Fields, volcanic eruptions in Sicily, migrant shipwrecks, and all other potential threats, trainees and young professionals are likely to be involved in emergency preparedness and response, despite having received no training on specific behaviors to be adopted during emergencies.

The link between public health and emergencies underscores the need for adequate preparedness to ensure the awareness of health personnel. Implementation of training courses can lead to preparedness, better handling of unforeseen situations, and safeguarding of community health and social consequences.

The adage "preparedness is greater than response" underscores prevention as the key to managing large scale emergencies. Investing in preparedness through specialized training and integrated educational plans is crucial for dealing with every phase of emergencies and proactively addressing future health challenges.

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