Investigation of Health Workforce Communication Model in Decentralized Disaster Mitigation: Structural Equation Modeling Analysis

ABSTRACT

Aims: to analyze the Communication Model of Health Workers in Decentralized Disaster Mitigation, as high disaster risk mitigation makes this area an area that requires special attention in disaster management efforts.

Materials & Methods: This paper adopted an explanatory quantitative research study approach, referring to the validated metrics measured customer focus, leader commitment, situational awareness, media partnership and health workforce communication. The Regional Health Workforce in East Java involves 214 local government primary health workers. Direct variable links were examined using PLS-SEM.

Findings: Customer focus (β = 0.735; p = 0.001), leader commitment (β = 0.621; p = 0.001) situational awareness (β = 0.542; p = 0.001), media partnership (β = 0.387; p = 0.001) significantly directly contribute to Health Worker Communication.

Conclusion: The Health Worker Communication Model in Decentralized Disaster Mitigation can be improved through the variables of customer focus, leader commitment, situational awareness, and media partnerships. Selective Health Workforce Communication is critical in evaluating customer focus, leader commitment, situational awareness, and media partnerships. Decentralized Health Workforce Communication requires management of a diverse and coordinated workforce in Disaster Mitigation.

Keywords: Customer focus; Leader Commitment, Situational Awareness, Media Partnerships; Health Worker; Communication Disaster Mitigation

In press

Background

When a disaster strikes, several measures are necessary, involving a wide range of players [1], including institutions like the Disaster Health Management, which must work and rely on the different stakeholders [2]. Plenty of municipalities throughout the world are expected to face increased losses from major natural catastrophe occurrences, such as floods, storms, and wildfires [3]. The capacity to adapt from previous catastrophes will be vital for improving local readiness for future occurrences and minimizing disaster risk [4]. Information and communication technology is critical in allowing data and information to be collected and guaranteeing successful communication strategies that match the demands for speed and accuracy [5]. The high disaster risk makes this area one that requires special attention in disaster management efforts [6]. Therefore, it is important to understand the disaster dynamics in this region in order to design more effective strategies to reduce the impact of disasters on the community and the environment [7]. This has been seen notably in US agencies, local governments, and emergency services, but also in European towns and school districts. Studies show that public relations officers, government agencies, and the general public have effectively used social media to convey accurate information and verify information in order to debunk rumors during catastrophes [8]. Only a few studies have focused on the recuperation and preparedness stages, as well as nations in the Global South, with the exception of Australia. Most studies have not looked into the demographics of social media users beyond their geographic location, status in/out of the disaster zone, and the frequency and content of their posts [9].

Researchers observed that the internet-based disaster information and data systems and social media of the Indonesian Disaster Health Management [10], currently provide inadequate data and information for disaster communication with the public and are unable to meet the needs of the various agencies involved in disaster management [11]. Unlike population data, where the agency responsible for providing data does not have activities that rely on population data, almost all Disaster Health Management activities require disaster data and information in their planning and implementation [12].

Communication is an important channel for agencies, particularly Disaster Health Management [13], to understand and implement effective disaster communication strategies [14], not only during emergency response but also in the planning and implementation of activities at all stages of disaster response[15]. To accomplish successful and long-term communication in disaster mitigation programs, efforts must be taken to build appropriate communication mechanisms that enable collaboration between scientists and local populations [16]. Haddow & Haddow identify five dimensions of disaster communication: Customer focus, which means understanding what information the public requires; Leader commitment, which refers to how a leader performs their role in an emergency response situation, requiring a commitment to effective and active communication; Situational awareness, which refers to effective communication when it involves collecting, analyzing, and disseminating accurate information about the disaster; Media partnership, which entails partnering with the media to acquire information and then spreading it to the public; and Incorporating communication into disaster mitigation planning and operations, which necessitates assistance from a variety of ways, both soft and hard power [17]. The soft power method entails preparing the community for catastrophes via outreach and knowledge sharing [18].

The critical importance of disaster data, information, and communication, combined with the high complexity of their management strategies, has prompted researchers to conduct a more in-depth investigation into the Indonesian Disaster Health Management's disaster mitigation communication strategies [19]. The purpose of this study is to assess if the communication tactics used are effective in transmitting information and knowledge regarding disaster management to the public, as well as to identify any barriers to such communication. In this study, the researchers chose the heads of the Emergency and Logistics Division and the Prevention and Preparedness Division [20]. The research explains Investigation of Health Workforce Communication Model in Decentralized Disaster Mitigation: Structural Equation Modeling Analysis

Materials & Methods

Study Design and Data Source

Explanatory quantitative research examined the causal relationships among latent variables and fluency variables [21] and health worker communication in decentralized disaster mitigation. The explanatory design examined five dimensions of disaster communication: customer focus, leader commitment, situational awareness, media partnership. Data from health workers with at least one year of experience in providing and conducting disaster communication in handling what happened and related to the research variables involved as many as 214 health workers in East Java, Indonesia, healthcare institutions. The size of the study sample investigated through SEM (Structural Equation Modeling), according to the rule of thumb, involves obtaining a minimum sample of five to ten times the predicted parameters. The size of the research sample is Customer Focus there are 4 parameters to be estimated, Leader Commitment there are 5 parameters, Situational Awareness there are 5 parameters, media partnership there are 4 parameters, health workforce communication there are 4 parameters and 4 arrow directions or correlations, so that the total is 26 parameters multiplied by 10. So, the maximum sample size is 260. In this study the fixed sample size was 214. The approved empirical research instrument influenced a self-administered structured questionnaire. The questionnaire measured customer focus, leader

In press

commitment, situational awareness, media partnership and health workforce communication. Each question was assessed on a five-point scale, from 1 (strongly disagree) to 5 (strongly agree). Contextual adjustments made the instrument applicable to decentralized health while preserving construct validity. The validated status was shown to have discriminant validity. The following criteria were used to assess discriminant validity: customer focus (0.878), leader commitment (0.872), situational awareness (0.829), media partnership (0.881), health workforce communication (0.816). A single-factor, unidimensional model with a factor score of 0.978 was shown to exhibit structural validity. Internal consistency (Cronbach's alpha = 0.843; Guttman split-half coefficient = 0.941) revealed outstanding results.

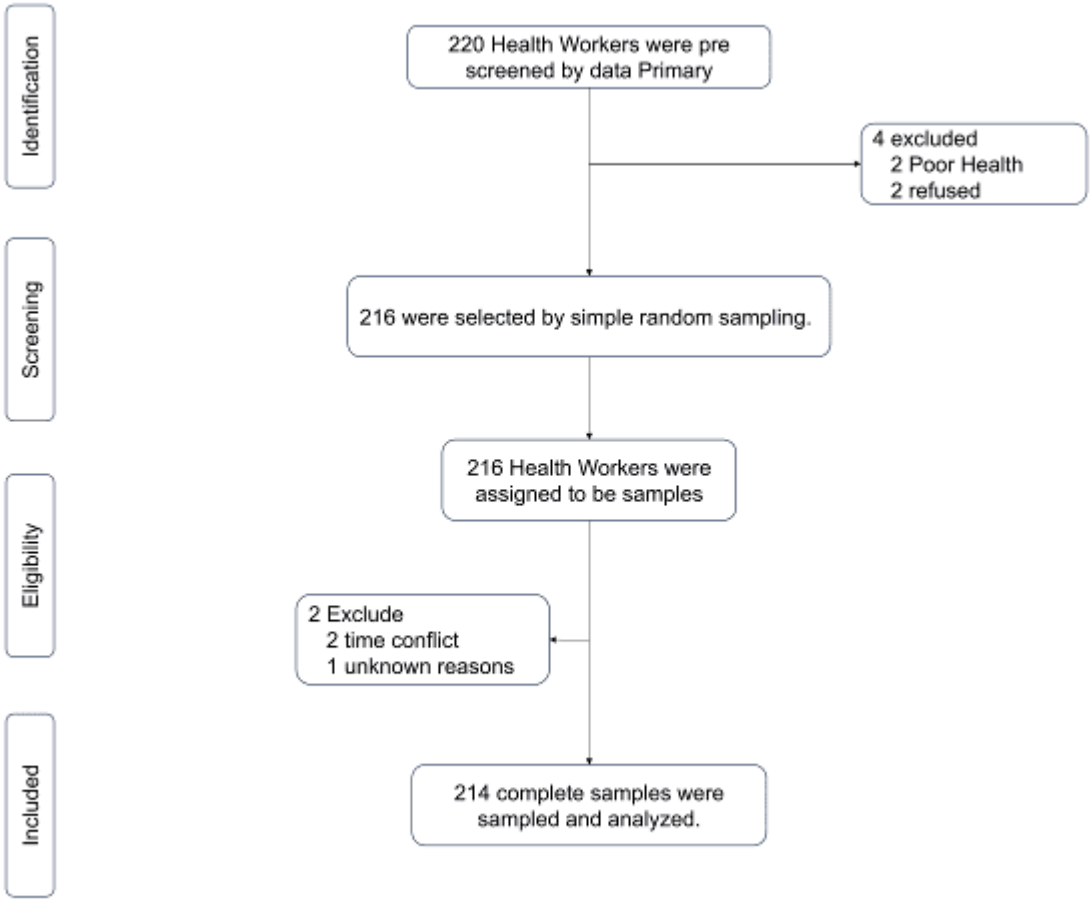

Figure 1. Assessment, Randomization, and Finalization Sample

Data Collection Procedure:

The current study used a main data model drawn from a questionnaire issued to healthcare staff. Data collecting steps: This pretty tiny survey was conducted utilizing a web-based questionnaire prepared with Google Forms. The questionnaire was prepared by the research team using factors such as customer focus, leadership commitment, situational awareness, and media relationships. Based on data from 214 healthcare professionals in East Java, Indonesia, the questionnaire was sent via a link, allowing healthcare workers to access it from their jobs. The survey included closed-ended questions using a Likert scale, multiple-choice questions, and open-ended questions. The use of the questionnaire format allowed researchers to collect quantitative data. A brief description of

the Google Form format and question types can help people understand how the data was generated. However, after the survey was released, validity and reliability checks were conducted to ensure the measurement tool was competent and consistent. Cronbach's alpha test was used to measure reliability, while factor analysis and construct validity were used to determine validity. The instrument had previously been evaluated in a pilot test to assess its accuracy and suitability for this research environment. These standards included identifying public healthcare institutions by type, location, and patient population.

Setting

Regional Health Officers in East Java 2025, Indonesia

Data analysis

In this study, data was screened and then analyzed using the SEMpls tool to assess research correlations and develop models based on the research findings of Investigation of Health Workforce Communication Model in Decentralized Disaster Mitigation. Smart-PLS version 4 was tested by implementing SEM and PLS. PLS-SEM was utilized for theory construction, analysis of prediction, and sophisticated models with several latent parameters [22]. The structural and measurement models were evaluated in two stages. The route coefficient and indirect impact were investigated using bootstrapping and resampling. T-values greater than 1.96 and p-values less than 0.05 were considered statistically significant at 95%. This technique significantly inferred direct and mediated study variable relationships [23]. The size of the study sample investigated through SEM (Structural Equation Modeling), according to the rule of thumb, involves obtaining a minimum sample of five to ten times the predicted parameters. The size of the research sample is Customer Focus there are 4 parameters to be estimated, Leader Commitment there are 5 parameters, Situational Awareness there are 5 parameters, media partnership there are 4 parameters, health workforce communication there are 4 parameters and 4 arrow directions or correlations, so that the total is 26 parameters multiplied by 10. So, the maximum sample size is 260. In this study the fixed sample size was 214.

Ethical Approval and Consent to Participate

This research has received a letter of Ethical approval for this study, which was obtained from the Health Research Ethics Committee of Noor Huda Mustofa with number 3176/KEPK/UNIV-NHM/EC/X/2025.

In press

Findings

Below were the detailed research results based on Health Workers' characteristics, Gender, Age, and Health Profession.

Table 1: Explains the largest percentage of Health Workers Characteristics: Gender, Age, and Health Workers.

Table 1. Description of Health Workers characteristics

	Frequency	**Percentage %**

Age	20 - 40 Years Old	110	51.4
	41- 60 Years Old	104	48.6
Gender	Male	106	49.5
	Female	108	50.5
Place of residence	Urban	112	52.3
	Rural	102	47.6
Education degree	Diploma	97	45.3
	Bachelor's	103	48.2
	Master's	14	6.5
	Doctorate	0	0.0
Health Workers	Medical Doctor	31	14.4
	Dentist	31	14.4
	Nurse	43	20.0
	Midwife	21	9.8
	Health Promotion Officer	21	9.8
	Epidemiologist	9	4.3
	Environmental Health Officer	6	2.8
	Medical Laboratory Technologist	21	9.8
	Pharmacist	15	7.2
	Nutritionist	16	7.5

The characteristics of health workers in this study showed a high proportion of health workers aged between 20 and 40 years (51.4%), which was within the productive age range. From the aspect of gender, most health workers were female (50.5%), which indicated that the majority of participating health workers had obtained a foundation of information about quality of work life that was more appropriate and balanced. Variations among health workers were also an important aspect of this study, showing a high proportion of health workers whose place of residence was urban (52.3%). Educational degree showed a high proportion of health workers with a Bachelor's degree (48.2%). Although the distribution of health workers was even across each type of health worker, there were 10 types of professions, each accounting for 10%. The results also showed a high proportion of health workers who were nurses (20%).

Research Reliability

Below were the detailed Research Reliability. Table 2: Explains the Construct Reliability and Convergent Validity.

Table 2. Results of Construct Reliability and Convergent Validity

Construction	***Cronbach's Alpha***	***Composite Reliability***	***Average Variance Extracted (AVE)***

Customer Focus	0.823	0.852	0.735
Leader Commitment	0.815	0.836	0.671
Situational Awareness	0.741	0.879	0.841
Media Partnership	0.878	0.920	0.717
Health Workforce Communication	0.966	0.960	0.861

Analysis of construct reliability using Cronbach's Alpha, Composite Reliability, and Average Variance Extracted (AVE) revealed that all indicators in the construct items had a high level of dependability. Cronbach's Alpha scores revealed that the internal consistency of each construct was in the highly satisfactory category, indicating that the items in the construct were able to assess the desired features reliably. The Composite Reliability findings supported this conclusion with high values across all constructs, demonstrating that the measurement parameters had great composite reliability in representing the hidden construct. Furthermore, the results for each construct confirmed internal consistency and validated the reliability estimates utilized in the partial least squares Structural Equation Modeling (PLS-SEM) technique. The indicators employed proved their capacity to reliably assess essential aspects of the Health Workforce Communication Model in Decentralized Disaster Mitigation. This situation was observed from the representation of measurements such as customer focus, leader commitment, situational awareness, media partnership, and health workforce communication. All constructs also showed Average Variance Extracted (AVE) values above the minimum threshold of 0.50, indicating that a sufficiently high proportion of the indicator variance was explained by the latent construct. Thus, the convergent validity of all constructs was adequately achieved. This reliability and validity indicated that the instrument used in this study was reliable for measuring stunting prevention based on the Health Workforce Communication Model in Decentralized Disaster Mitigation.

Fornell-Larcker Criterion Values for Discriminant Validity

Below were the detailed Discriminant Validity. Table 3: Explains the Discriminant Validity Assessment, analyzing the Fornell-Larcker Category

Table 3. Discriminant Validity Assessment: Analyzing the Fornell-Larcker Category

Construction	Customer Focus	Leader Commitment	Situational Awareness	Media Partnership	Health Workforce Communication
Customer Focus	**0.872**				
Leader Commitment	0.733	**0.819**			
Situational Awareness	0.278	0.297	**0.809**		
Media Partnership	0.875	0.768	0.297	**0.898**	
Health Workforce Communication	0.287	0.382	0.295	0.278	**0.789**

The Fornell–Larcker requirements stipulated that the products of the square roots of the AVE for each hidden component were required to be considerably greater than the correlation coefficients between the specific construct and its counterparts. Table 3 provided strong evidence of discriminant validity, as the diagonal elements (square roots of AVEs) were greater than the off-diagonal inter-construct correlations.

In press

Structural Model Evaluation

Below is the detailed Structural Model Evaluation, Table 4: Explains the Structural Model Results (Direct Effects).

Table 4. Structural Model Results (Direct Effects)

Path	β	t-value	p-value	f^2	Result
CF (X1) → HWC	0.735	2.783	<0.001	0.211	Supported
LC (X2) → HWC	0.621	2.782	<0.001	0.287	Supported
SA (X3) → HWC	0.542	2.881	<0.001	0.280	Supported
MP (X4) → HWC	0.387	2.987	<0.001	0.235	Supported

CF= Customer Focus; LC= Leader Commitment; SA= Situational Awareness; MP= Media Partnership;
HWC = Health Workforce Communication.

Figure 1. To assess the structural model, path coefficients (β), t-values, p-values, and effect sizes (f^2) were used. The direct impacts were presented in Table 4. The study found that a stimulating atmosphere positively impacted the outcome variable CF ($\beta = 0.735$, $t = 5.227$, $p < 0.001$), followed by LC ($\beta = 0.621$, $t = 6.845$, $p < 0.001$). SA ($\beta = 0.542$, $t = 9.240$, $p < 0.001$) and MP ($\beta = 0.387$, $t = 7.776$, $p < 0.001$). The research indicated that the motivational climate significantly impacted HWC ($f^2 = 0.287$), whereas other relationships had small to moderate effect sizes.

In press

Figure 1. Investigation of the Health Workforce Communication Model in Decentralized Disaster Mitigation

Hypothesis testing for the Health Workforce Communication Model in Decentralized Disaster Mitigation: The indicators of the Health Workforce Communication Model in Decentralized Disaster Mitigation included Customer Focus, Leader Commitment, Situational Awareness, Media Partnership, and Health Workforce Communication. The values included β, standard deviation (STDEV), t-value, p-value, effect size (f^2), and hypothesis testing results. The model showed the structural relationships among Customer Focus, Leader Commitment, Situational Awareness, Media Partnership, and Health Workforce Communication performance using PLS-SEM. The image illustrated the strength and direction of the connections using standardized path coefficients. As expected, Customer Focus, Leader Commitment, Situational Awareness, and Media Partnership improved Health Workforce Communication.

Discussion

Communication between registered nurses and unlicensed assistive persons may be enhanced by clearly defined roles and duties, better delegation procedures, efficient communication, and improved interpersonal interactions. Future studies should concentrate on improving communication procedures and developing registered nurses' delegation abilities

through education [24]. explained again by research in India that Communication amongst health workers is the most important ingredient in delivering patient-centered care (customer focus). Health providers may grasp the patient's needs, hopes, and condition as a whole by using effective communication techniques such as listening with empathy, delivering clear explanations, and developing positive connections. However, without appropriate communication, health services tend to be suboptimal because patient requirements are not well transmitted or understood, resulting in treatments that are not totally patient-centered [25]. a little different in the United States, where without effective communication, health services risk falling short of their objectives and failing to satisfy the requirements of their patients. In the context of disaster mitigation, this becomes especially critical since emergency situations necessitate the rapid, accurate, and understandable distribution of information to victims and other health professionals. Effective communication ensures priority treatment, lowers fear, and enhances safety and service quality, allowing a customer-focused strategy to be implemented even during a crisis [26].

Mitigation entails mastering the required behavioral complexity through a deeper understanding of shared leadership, cultivating a mutually valued relationship aimed at collective identity, and leveraging collective efficacy, interdependence, complementary strengths, and the positive effects of psychological ownership and territoriality. Criteria-based selection, proper support, and explicit accountability procedures are all part of strategic organizational implementation, as is evaluating leaders' actions and model efficacy. Navigating these obstacles would promote agency and well-being, satisfied relationships, and successful collaborative work, allowing the dyad leadership model to reach its full potential [27]. Reviews are different in China The presence of humble leadership in an organization considerably decreases burnout, with work engagement and subjective well-being mediating this link. In addition, the study shows that compassion has a buffering impact on the correlations described above. The empirical evidence makes various contributions in theory and practice, among which the most important one was recognizing the fundamental value of humble leadership in mitigating the effect of burnout in healthcare administration [28]. Comparison with other studies in Michigan shows that results show effective leadership communication predicted burnout and will to stay more strongly than remuneration satisfaction and work-from-home flexibility. Feeling appreciated by the company moderated the association between leadership communication and the outcome factors [29]. In order to improve healthcare provider preparedness for disaster events, we propose integrating innovative technologies such as virtual and augmented reality to create immersive simulations that foster situational awareness and a resilient disaster mindset. Addressing this knowledge gap will boost healthcare personnel's confidence and enhance patient outcomes during a crisis [30]. compared to other research reviews, that Individual characteristics such as attention, memory, past experience, personal aspirations, and cybersecurity training all play an important part in determining situational awareness. In addition, environmental and system-level variables such as workload, information overload, system complexity, and over-reliance on automation have a major influence on healthcare professionals' capacity to spot cyber risks. The study emphasizes the need for integrated solutions that include user-centered system design, awareness training, and efficient reporting channels. These findings contribute to the increasing body of knowledge on human aspects in cybersecurity and serve as a basis for improving incident identification and response in healthcare contexts [31]. Many of the most highly shared social media pieces did not precisely adhere to the Intergovernmental Panel on Climate Change's core statements. Less than 25% of the posts included the report's summary statement, and around half suggested no remedies at all. Instead, they focused on the gravity of the problem and the urgency with which action is required. Finally, there was a relatively low presence of voices from the organized climate countermovement, which frequently questions the necessity for broad-based and immediate mitigation action. We address the implications of our findings for future research and practical applications [32]. compared to

In press

research in Indonesia that contributes to disaster communication theory by incorporating media into Indonesia's unique governance and socio-cultural environment to form the foundation of a collaborative strategy, providing a framework for improving preparedness, transparency, and community trust [33]. Other studies research in the United States that construct a language model that can comprehend how people explain their condition in a 911 call, allowing Llama2 to assess the content and provide relevant directions to the telecommunicator, as well as generating workflows to alert government entities with the caller's information as needed. Another advantage of this language model is its capacity to assist individuals during a major emergency occurrence when the 911 system is overburdened, by providing users with easy instructions and alerting authorities of their location and emergency status [34].

Conclusion

The Health Worker Communication Model in Decentralized Disaster Mitigation can be improved through the variables of customer focus, leader commitment, situational awareness, and media partnerships. Selective Health Workforce Communication is critical in evaluating customer focus, leader commitment, situational awareness, and media partnerships. Decentralized Health Workforce Communication requires management of a diverse and coordinated workforce in Disaster Mitigation.

Acknowledgments:

The author would like to thank Universitas Noor Huda Mustofa, Faculty of Nursing, Bangkalan, Indonesia, and the Regional Health workers in East Java, who have agreed to allow the authors to analyze the data in this article.

Ethical Permissions:

This research has received a letter of ethical approval from Universitas Noor Huda Mustofa with number 3176/KEPK/UNIV-NHM/EC/X/2025.

Conflicts of Interest:

There is no conflict of Interest to declare

Authors' Contribution:

Zuryaty: Methodologist/Main Concept, Statistical Analyst (40%).
Mohammad Lutfi: Statistical Analyst, Introduction Writer (30%).
Mochammad Ahied: Assistant Researcher, Discussion Writer (30%).

Funding/Support:

Not Found

In press