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RESEARCH ARTICLE

HOSPITAL PREPAREDNESS FOR DISASTER RISKS USING SWOT ANALYSIS AND THE HOSPITAL SAFETY INDEX (HSI)

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ABSTRACT

BACKGROUND:

West Java Indonesia is classified as high risk for disasters. The Cabangbungin Hospital is a type D health facility run by the Government of Bekasi Regency, West Java, Indonesia. A report by the Quality Committee of Cabangbungin Hospital revealed that the hospital has not yet satisfied all indicators on disaster mitigation team preparedness. For that reason, it is deemed necessary to perform a SWOT analysis on the result of the hospital safety index (HSI) concerning the hospital's disaster preparedness.

OBJECTIVE:

To determine the disaster preparedness of Cabangbungin Hospital based on the SWOT analysis on the HSI and to determine the service quality strategy of Cabangbungin Hospital in facing disasters.

METHODS:

Analytical observational research adopted a qualitative descriptive approach using primary and secondary data. The results of a group discussion on a SWOT analysis plan toward internal and external factors of Cabangbungin Hospital. The informants in this study consisted of the hospital's Occupational Health and Safety (OHS) team, the hospital facilities and infrastructure team, and the hospital management representatives. The secondary data utilized in this study were derived from the results of the hospital accreditation previously conducted.

RESULTS:

Based on the SWOT analysis, the Cabangbungin Hospital scored 1,465 on the internal factor and 1,55 on the external factor. The hospital is required to be aggressive in its service quality strategy.

CONCLUSION:

Aggressive action is necessary as regards the improvement of the fire safety system, the emergency response activities and disaster management in the Cabangbungin Hospital.

KEYWORDS

hospital safety index, service quality strategy, disaster

INTRODUCTION

Cabangbungin Regional General Hospital (RSUD) is a type D hospital run by the government of Bekasi Regency, West Java, Indonesia. The hospital was founded in 2017 and was operational thenceforward despite lacking certain facilities, infrastructure, and human resources. By the end of 2019, Cabangbungin Hospital applied for accreditation to the Indonesian Commission on Accreditation of Hospital (KARS) which had used a new standard: the National Standards for Accreditation of Hospital (SNARS).

Accreditation is carried out to ensure the quality of the hospital.[1] The hospital was accredited with an intermediate three-star rating in November 2019. During the COVID-19 pandemic, Cabangbungin Hospital was appointed a Covid-19 referral hospital and was only restricted to Covid-19 referred patients. The Cabangbungin Subdistrict was inundated by floodwaters in 2021, but Cabangbungin Hospital had yet any role in tackling the paralyzing event as it did not have disaster preparedness.[2]. The Quality Committee of Cabangbungin Hospital received a report on the quality indicators of its emergency room (IGD), showing that during the first and second quarters of 2022 the hospital failed to meet the disaster mitigation team preparedness. Emergency and disaster handling in hospital accreditation standards are kept under the category facility and safety management standards. The latter represents the Hospital Safety Index (HSI) which assesses hospitals' safety and vulnerabilities in the event of disasters. [3] The Hospital Safety Index consists of various elements, including multi-hazards faced by hospital facilities, resilience of hospital building structure that will ensure the safety of workers, patients, and visitors, non-structural safety i.e. hospital facilities and utilities such as water, electricity, communication, and medical gas, remain operational during or after a disaster and disaster management that manages various types of hazards, including the existence of disaster management committees and hospitals, as well as relevant procedures to address all hazards by hospitals.[4] The Hospital Safety Index encompasses all information from all modules and indicators to present an overall picture of a hospital's disaster preparedness and resilience.[4] Different aspects, such as hospitals' commitment to set up a disaster management organization, provision of facilities and infrastructure, implementation of procedure management, management of disaster management resources, and organization of training and education related to disaster management, are very important. Hospital disaster preparedness, supported by trained personnel and appropriate procedures, aims to ensure rapid response and proper actions, which represent the key objectives of hospital disaster management. [5]

METHODS

INFORMANTS

A discussion group forum to perform SWOT analysis on the HSI instrument was held, involving 10 managers of the Cabangbungin Hospital: two from the emergency room team, two from the governance management division, two infrastructure managers, two hospital safety managers, two hospital quality managers. The selection of respondents was due to their knowledge of Cabangbungin Hospital in respect of their duties.

MEASURES

This research uses a qualitative descriptive approach to perform SWOT analysis. In this study, the HSI SWOT analysis used a SWOT analysis table according to the HSI results.

TABLE 1. SWOT ANALYSIS ON HOSPITAL SAFETY INDEX

No	Aspect	Strengths	Weaknesses	Opportunities	Threats
1	Structural Safety	HSI Result	HSI Result	HSI Result	HSI Result
2	Non-structural safety	HSI Result	HSI Result	HSI Result	HSI Result
3	Emergency and Disaster Management	HSI Result	HSI Result	HSI Result	HSI Result

The weighted value was assessed based on the internal factor analysis strategy (IFAS) which combined strength (S) and weakness (W), with a total value of 1. (The calculation of the weighted value, which was based on the external factor analysis strategy (EFAS) combining opportunity (O), threat (T) with a total value of 1. 1.0 indicates substantial and 0.0 suggests insignificant.[6]

TABLE 2. RATING WEIGHTED VALUE.

No	Score	Details on Strengths and Opportunities Factors	Details on Weaknesses and Threats Factors
1	1	Factor Has weak influence rate on planning	Factor has very strong influence rate on hindering planning
2	2	Factor has moderate influence rate on planning	Factor has strong influence rate on hindering planning
3	3	Factor has strong influence rate on planning	Factor has moderate influence rate on hindering planning
4	4	Factor has very strong influence rate on planning	Factor has weak influence rate on hindering planning

DATA ANALYSIS

SWOT analysis was carried out to measure Internal Strategy Factors (IFAS) and External Strategy Factors (EFAS) through discussion group forum activities which brought up issues on the hospital safety index (HIS) based on SWOT analysis for Internal Strategy Factors (IFAS) and External strategy factors (EFAS).

RESULTS

Results of the SWOT analysis through a discussion group forum in Cabangbungin Hospital as regards Internal Strategy Factors (IFAS) are available on table 3 below:

TABEL 3. SWOT ANALYSIS: IFAS

Internal Strategy Factors *(IFAS)*		Weight	Rating	Sum
1	*Infrastructure protection,access and physical security*	0.07	4	0.28
2	*Telecommunication systems*	0.07	4	0.28
3	*Fire protection system*	0.09	4	0.36
4	*Fuel storage systems*	0.07	3	0.21
5	*Heating,ventilation,and air-conditioning (HVAC) systems*	0.07	3	0.21
6	*Office and storeroom furnishings and equipment (fixed and movable)*	0.025	3	0.075
7	*Medical and laboratory equipment and supplies used for diagnosis and treatment*	0.025	2	0.05
8	*Coordination of emergency and disaster management activities*	0.09	4	0.36
9	*Human resources*	0.07	4	0.28
10	*Patient care and support services*	0.04	1	0.04
		0.62		2.145
	Weaknesses Factors			
1	*Building integrity*	0.03	2	0.06
2	*Architectural safety*	0.04	1	0.04
3	*Electrical systems*	0.04	2	0.08
4	*Water supply system*	0.04	2	0.08
5	*Waste management systems*	0.04	2	0.08
6	*Medical gases systems*	0.04	2	0.08
7	*Hospital emergency and disaster response planning*	0.04	1	0.04
8	*Communication and information management*	0.04	1	0.04

Internal Strategy Factors *(IFAS)*		Weight	Rating	Sum
9	*Logistics and finance*	0.03	2	0.06
10	*Evacuation, decontamination and security*	0.04	1	0.04

Results of the SWOT analysis through a discussion group forum in Cabangbungin Hospital as regards External Strategy Factors (EFAS) are available on table 4 below:

TABLE 4. SWOT ANALYSIS: EFAS

External Strategy Factors (EFAS)		Weight	Rating	Sum
	Opportunities (O)			
1	Human resources	0.3	4	1.2
2	Funding	0.25	2	0.5
3	Geographic (Higher than its surroundings)	0.15	3	0.45
		0.7		2.15
	Threats (T)			
1	Flood	0.1	3	0.3
2	Tsunami	0.1	1	0.1
3	Earthquake	0.1	2	0.2
		0.3		0.6

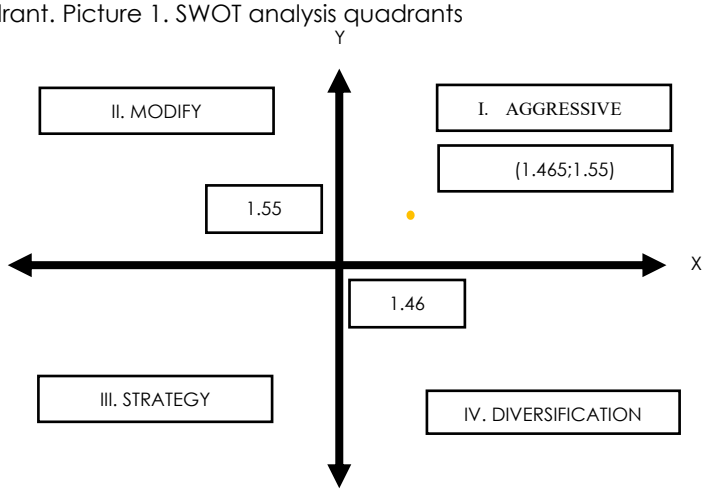
The analysis results of both SWOT IFAS and EFAS were equally assessed and yielded coordinate values as shown on table 5. The assessed values from Internal Factors and External Factors Tables were included in the SWOT analysis quadrants as shown in picture 1 of SWOT Analysis Quadrants.

TABLE 5. ASSESSMENT TABLE OF INTERNAL EXTERNAL FACTORS

Internal Factors	External Factors
X= strengths - weaknesses	Y= Opportunities - threats
X= 2.145 – 0.68 = 1.465	Y= 2.15 – 0.6 = 1.55
X=1.465	Y= 1.55

CONCLUSION

Results of SWOT analysis on IFAS and EFAS were included in X quadrant (1.465) and Y (1.55) so as to project the picture shown on right upper quadrant. Picture 1. SWOT analysis quadrants



Results of the SWOT analysis on Hospital Safety Index of Cabangbungin Hospital reveals 10 strength factors, 10 weakness factors, 3 opportunity factors, and 3 threat factors. Weighting and rating processes generated the values of internal factors at 1,465 and external factors at 1.55, leading to a position on right upper quadrant as a result. Thus, it means that Cabangbungin Hospital must be more aggressive in improving its qualities. Within a short term, intervening measures are recommended. In line with this recommendation, there is a need for the aggressive strengthening of internal factors, such as infrastructure, communication systems, fire protection systems, the provision of fuel for power generators in the event of outages, continuity of patient services during disasters, and the availability of disaster-trained healthcare professionals

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This research has an ethics clearance letter by Health Research Ethics Committee Binawan University with the number 256/KEPK-UBN/I/2025. Ethical review was conducted to ensure that the research does not violate ethical principles.

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