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Analysis of the Readiness of School Health Facilities and First Aid for Accidents in the Implementation of the Disaster-Resilient Schools Program in Malang City, Indonesia

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ABSTRACT

Purpose: This study aims to map the availability of School Health Services (UKS) facilities and the completeness of First Aid kits at partner schools in the Disaster-Resilient Schools program in Malang City, Indonesia.

Research Method: This study employed a descriptive cross-sectional design. Data were collected through observations conducted in November 2023 at four schools selected through purposive sampling, using a checklist that included 31 items related to school health unit (UKS) facilities and 21 items related to first aid supplies. The data were analyzed using frequencies and percentages.

Results and Discussion: The aggregate proportion of available school health facilities reached 72.58%. Bathrooms/toilets were found in only one school (25%), while stretchers were found in two schools (50%). The aggregate proportion of first-aid kit supplies reached 36.90%. Eye-wash cups and 100 mL vials of distilled water were not found in any of the schools. The results only describe the presence of items, not their functionality, adequacy, accessibility, or disaster preparedness.

Implications: Schools need to update their inventory and periodically check the condition and expiration dates of their supplies.

Originality: This study presents a contextual mapping of school health units (UKS) and first aid supplies at four partner schools in Malang City, Indonesia.

Keywords: school health programs; first aid supplies; school health; disaster-resilient schools; UKS; P3K.

1. Introduction

Natural disasters are a global phenomenon that cause significant harm, both in terms of loss of life and economic losses. Global data recorded 323 natural disasters in 2018, resulting in 11,745 deaths and



projected economic losses amounting to 0.15% of the world's total Gross Domestic Product (GDP) (EM-DAT, CRED/UCLouvain, and Our World in Data). In the same year, natural disasters also left more than 400,000 people homeless (Our World in Data). At the national level, Indonesia faced severe impacts, including 5,293 deaths, economic losses of 0.25% of the country's GDP, and 70,000 people forced to flee their homes during that period (IHME, Global Burden of Disease, and Our World in Data). The magnitude of these impacts underscores the importance of comprehensive and structured disaster management efforts to protect human health, well-being, and survival.

Educational institutions, as an integral part of the community, play a crucial role in disaster risk reduction efforts, particularly through programs such as Disaster-Resilient Schools or Disaster-Resilient Educational Units (SPAB) [4]. One of the supporting elements within the school environment is the School Health Unit (UKS), which includes basic health facilities and First Aid supplies. The availability of these resources is essential as initial support for health services at school. However, the mere presence of facilities and supplies does not automatically indicate a school's preparedness to face disasters, as preparedness is a broader concept encompassing the functionality and accessibility of resources, staff competence, emergency procedures, training, simulations, communication and referral systems, and actual response capacity.

The School Health Units (UKS) at the partner schools—SDN 1 Klojen, SMP Salahuddin, SMPN 3, and SMA Islam in Malang City—are involved in the "Disaster-Resilient Schools" community service program. In this context, there is currently no systematic mapping of the UKS facilities and first-aid supplies available at each school. The practical focus of this study, therefore, is not on disaster preparedness as a whole, but rather on the lack of information regarding the availability and completeness of basic health facilities at the four partner schools. This mapping is necessary so that schools can identify which items are already available and which still require attention.

Disaster management is a field rich in frameworks, models, and procedures developed to address crises. One widely recognized fundamental framework is the disaster management cycle, which conceptually divides disaster management efforts into four interrelated main phases: mitigation, preparedness, response, and recovery (Bustami, 2011). These four phases form a continuous cycle aimed at reducing the impact of disasters and accelerating the recovery of affected communities. Although school health units (UKS) and first-aid supplies can serve as supporting elements in this cycle, this study does not assess the implementation of the four phases of disaster management. The disaster cycle framework is used solely to explain the importance of health support facilities in school settings, not as a variable under evaluation.

Several previous studies have addressed disaster education, UKS management, first aid training, and the implementation of SPAB. Qodir *et al.*, (2023) investigated improvements in disaster knowledge among elementary school students in Srigonco, Malang. That study highlighted the importance of disaster education for students but did not assess the availability of UKS facilities or the completeness of first aid supplies. Thus, although conducted in the Malang region, the focus of that study differed from the mapping of school health facilities carried out in this study.

Hidayati (2021) examined UKS management at SICC Boarding School and documented the implementation of planning, organization, and coordination with health facilities. That study provided an overview of the managerial aspects of UKS. However, it was not conducted in Malang and did not specifically map the availability of UKS facilities or first-aid supplies within the context of the disaster-resilient school program. Meanwhile, Samoedra *et al.*, (2025) demonstrated that UKS and first-aid training can enhance the knowledge and skills of both teachers and students. These findings underscore

the importance of the competency dimension; however, this study did not measure participants' training, knowledge, skills, or ability to provide first aid. In the broader context of the Safe Schools Program (SPAB) implementation, Setiawan *et al.*, (2026) found that SPAB remains in the development stage and shows uneven success across schools. Schools that receive external support tend to implement the program more comprehensively than those operating independently. This prior evidence comes from Yogyakarta, Banten, Bandung, and Karanganyar and does not specifically address the availability of UKS facilities and first-aid supplies at partner schools in Malang City.

Previous studies reveal two gaps. First, research on disaster education and the "Disaster-Safe Schools" program has primarily assessed knowledge, training, program management, or policy implementation. At the same time, descriptive evidence regarding the availability of school health units (UKS) and first-aid supplies remains limited. Second, existing research has not provided a specific overview of the four partner schools in the "Disaster-Resilient Schools" program in Malang City. Therefore, this study is not intended to comprehensively assess school preparedness, test the effectiveness of UKS, or develop new UKS standards. This study is limited to documenting the availability and completeness of items listed in the observation instrument.

Based on these gaps, the research question is: What are the availability and completeness of UKS facilities and first-aid supplies at the four partner schools of the "Disaster-Safe Schools" program in Malang City? This study aims to identify and describe the UKS facilities and first-aid supplies available at SDN 1 Klojen, SMP Salahuddin, SMPN 3, and SMA Islam in Malang City. The study was conducted as a quantitative descriptive study within the context of implementing the "Disaster-Safe Schools" community service program. Thus, the community service activity serves as the implementation context, while data collection and analysis are framed within a descriptive research framework.

The novelty of this study lies in the presentation of school-specific maps showing the availability of UKS facilities and first-aid supplies at the four partner schools in Malang City. The study's contribution is contextual and descriptive, namely providing preliminary information to help each school determine priorities for meeting facility needs. The study's findings should not be generalized to all schools in Malang City or Indonesia. They should not be used to conclude the level of preparedness, compliance, adequacy, or disaster response capacity of schools without measuring these specific dimensions.

The remainder of this paper is organized as follows. Section 2 provides a literature review and hypothesis development. Section 3 presents the research method and design. Section 4 provides the results and discussion. Section 5 presents Concluding Remarks and Recommendations.

2. Literature Review and Hypothesis Development

2.1 Availability of School Health Facilities (UKS)

The availability of School Health Services (UKS) facilities refers to the presence of physical infrastructure, medical equipment, administrative supplies, and supporting resources necessary to provide basic health services within the school environment. These facilities may include a UKS room, beds, tables and chairs, a medicine cabinet, anthropometric measurement tools, basic examination equipment, first-aid supplies, health education materials, and service logbooks. In the concept of school-based health services, an easily accessible location, integrated services, qualified staff, and a student-friendly environment are key attributes that support the sustainability of health services (Borkowski *et al.*, 2023). The presence of health facilities in schools can also expand students' access to promotive and preventive

services, health screenings, management of acute complaints, and management of specific health issues (Itiriyeva, 2024). However, the availability of facilities must be distinguished from their adequacy, suitability, functionality, accessibility, and quality of service. The mere presence of a school health room or equipment does not automatically mean that the facility is functional, easily accessible, managed by competent staff, or capable of meeting all students' health needs.

In the Indonesian context, UKS facilities support the implementation of the UKS Triad, which encompasses health education, health services, and the promotion of a healthy school environment. The implementation of these three programs requires support from facilities and infrastructure so that activities are not merely administrative but can be implemented sustainably (Dinatha *et al.*, 2023). The results of Hasmara's (2023) study indicate that the completeness of UKS facilities and infrastructure can vary between schools; therefore, their assessment must use clear indicators, categories, and denominators. Availability assessments should be conducted using a consistent checklist so that percentages for each school can be compared and verified. In addition to medical facilities, inventory record-keeping, visitor logs, documentation of students' health conditions, and the management of medications and equipment are crucial supporting components. Ristanto & Murtadho (2023) found that the revitalization of school health units in inclusive elementary schools must be accompanied by the strengthening of administrative services and skills in recording and inventorying supplies and medications. Meanwhile, experiences operating school health units during in-person learning indicate that school health facilities also support education and preventive measures against infectious diseases within the educational environment (Sukaesih *et al.*, 2023).

The availability of facilities must be considered as one of the structural components of school health services, not as the sole measure of a school health unit's readiness or effectiveness. School-based health services face changing needs due to disease outbreaks, mental health issues, the needs of vulnerable groups, the development of telemedicine, and the increasing complexity of students' health needs (Carmine, 2024). Furthermore, the availability of resources does not necessarily guarantee that students' needs will be met if screening mechanisms, facility use, referrals, and follow-up procedures have not been standardized.

Gersch *et al.*, (2024) indicate that school-based health facilities may face inconsistencies in assessment and referral processes, as well as resource limitations in meeting students' needs. Therefore, this study defines the availability of UKS facilities solely as the presence of items listed on the checklist at the time of observation. This measurement does not include equipment functionality, ease of access, staff competence, service quality, emergency procedures, or actual response capacity. This definitional limitation is important to ensure that the study results only map available and unavailable facilities at the schools studied, without drawing conclusions that go beyond the observational data.

2.2 Contents of the First Aid Kit (P3K)

The adequacy of a First Aid kit refers to the availability of equipment and supplies needed to provide initial treatment for injuries or emergencies before the victim receives further medical assistance. Adequacy cannot be assessed solely by the presence of a First Aid kit; the type, quantity, condition, expiration date, storage, and accessibility of each item must be evaluated. In principle, first aid supplies are tailored to the risks, user characteristics, and environmental conditions of the location where they are provided. First aid guidelines identify the contents of a first aid kit as a critical component in managing wounds, bleeding, injuries, and medical emergencies; however, their use must remain within

the scope of the first aider's competence (Djävrv *et al.*, 2025). In a school setting, first aid supplies may include wound care materials, personal protective equipment, simple assistive devices, cleaning solutions, and other items relevant to students' health risks. Therefore, assessments of supply completeness must use consistent item lists and denominators so that completeness percentages can be accurately calculated, compared, and verified.

The availability of first-aid supplies in schools must be accompanied by the school community's knowledge and skills in using each item. Karabulut & Abi (2022) found that some elementary school teachers lacked access to first-aid kits in the schools or classrooms where they worked, and that their knowledge of first-aid procedures remained limited. These conditions indicate that the availability of supplies and user competence are two distinct dimensions, although they are mutually supportive. Practice-based programs led by school health personnel have been shown to improve teachers' knowledge, skills, and confidence in handling students' health emergencies (Elizalde *et al.*, 2024). In Indonesia, UKS and first aid training for teachers also underscores the importance of integrating first aid education with the provision of school health supplies (Rosyidah *et al.*, 2025). Training within the school community is necessary so that teachers and students can properly recognize the functions, limitations, and procedures for using the supplies. Similarly, educational interventions for adolescents should cover the contents of a first-aid kit, the function of each item, and guidelines for their use in emergencies (Ramos-Castaneda *et al.*, 2025).

In the context of disaster-resilient schools, first-aid supplies are among the supporting elements of the initial response but are not the sole indicator of disaster preparedness. A study by Hodson *et al.*, (2024) indicates that schools are strategic venues for delivering disaster preparedness and first aid education; however, the effectiveness of learning resources and their implementation still requires evaluation. First aid kits can also be incorporated as part of broader emergency supplies alongside evacuation needs, water, food, hygiene supplies, and the needs of vulnerable groups. Maghelal & Arlikatti (2025) emphasize the importance of emergency kits in supporting initial response efforts and highlight the need for schools to be involved in education on preparing disaster supplies. However, this study limited its assessment of first-aid kit completeness to the proportion of checklist items observed. The assessment did not cover user skills, access speed, adequacy of quantities relative to the school population, emergency procedures, referral systems, or actual response capacity. Given these limitations, the study's findings merely describe which first-aid items are available and which are not, without concluding the school's overall level of disaster preparedness.

2.3 Disaster-Resilient Educational Institutions (SPAB)

Disaster-Resilient Educational Institutions (SPAB) is a systematic approach to preventing and mitigating the impact of disasters on students, school staff, school facilities, and the continuity of educational services. The implementation of SPAB encompasses three pillars: safe educational facilities, disaster management in schools, and education on disaster prevention and risk reduction. Thus, SPAB is not only related to the availability of facilities but also encompasses policies, institutional frameworks, risk mapping, emergency procedures, early warning systems, evacuation routes, simulations, the competencies of the school community, and coordination with stakeholders. An evaluation of SPAB in Indonesia indicates that integrating disaster risk reduction education requires policy support, school leadership, stakeholder participation, resources, and program adaptation to local hazard characteristics (Amri *et al.*, 2022). Disaster risk management in schools must also be implemented through hazard

identification, vulnerability assessment, planning, resource organization, mitigation implementation, and continuous evaluation of activities (Pramesti *et al.*, 2023). Therefore, the implementation of SPAB is a multidimensional process that cannot be assessed solely based on the presence of school health units (UKS) or first-aid kit (P3K) supplies.

Disaster education and literacy are key components of SPAB because schools play a role in shaping students' knowledge, attitudes, and actions in the face of hazards. Teachers serve as strategic actors in integrating disaster-related content into lessons, conveying risk information, and guiding students during training and simulations. SPAB literacy activities for geography teachers in Boyolali demonstrated increased understanding of the concepts and the implementation of disaster-safe schools (Noviani *et al.*, 2023). An SPAB workshop, combined with psychological first aid, can also enhance facilitators' skills in supporting schools while broadening their understanding that disaster management encompasses both physical and psychological needs (Dwarawati *et al.*, 2023). Nevertheless, increased knowledge through outreach or training does not automatically indicate that SPAB has been fully implemented. Ghale *et al.*, (2025) found that students may still have knowledge gaps in disaster risk reduction, even when living in disaster-prone areas. These findings reinforce the need to integrate disaster-related content into the curriculum, conduct practical exercises and periodic simulations, and collaborate with disaster management organizations.

SPAB evaluations should use a framework that encompasses hazard conditions, facilities, institutional capacity, policies, disaster education, and program-induced changes. Wardhani *et al.*, (2024) highlight the importance of evaluating SPAB implementation in terms of risk pressures, actual school conditions, and implemented responses. Self-assessments can also help schools identify strengths and weaknesses in areas such as access to education, inclusive learning, safety, well-being, and support services (Lordos *et al.*, 2024). More broadly, schools play a role in disaster risk management through education, training, simulations, coordination, psychosocial support, and the restoration of educational services (Marzban *et al.*, 2025). In this study, the SPAB was positioned solely as the programmatic context underpinning the mapping of school health room (UKS) facilities and first aid kit (P3K) supplies at the four partner schools. The study did not comprehensively evaluate all three pillars of SPAB, did not measure program effectiveness, and did not assess actual disaster preparedness. Therefore, the findings regarding the availability of UKS facilities and the completeness of first-aid kits represent only a small portion of SPAB's supporting resources and cannot be used to conclude the overall level of SPAB implementation or success.

3. Research Method

This study employed a descriptive cross-sectional design. The descriptive design was chosen to describe the availability of School Health Unit (UKS) facilities and the completeness of First Aid for Accidents (P3K) supplies at the time of observation. A cross-sectional approach was used because data were collected at a specific point in time, namely, November 2023. The study was conducted within the context of the "Disaster-Resilient Schools" community service program, and data collection, processing, and reporting were conducted using a quantitative descriptive research framework. This study did not measure disaster preparedness, the effectiveness of UKS, compliance with standards, or school response capacity.

The study's target population comprised partner schools participating in the "Disaster-Resilient Schools" program in Malang City. The research sample was selected using purposive sampling, specifically schools designated as program sites. The sample schools included SDN 1 Klojen, SMP Salahuddin, SMPN 3, and SMA Islam in Malang City, representing various educational levels. The unit of analysis was each observed school. Because the sample was selected purposively and included only four schools, the study's findings are limited to these schools. They are not intended to represent all schools in Malang City or Indonesia.

Data collection was conducted in November 2023 by the Disaster Medicine Division of the Emergency Medicine Residency Program at the Faculty of Medicine, Brawijaya University. The implementation team consisted of one faculty member as the project leader, three faculty members as team members, and three students who assisted in carrying out the program. This activity was a collaboration between the Department of Emergency Medicine at the Faculty of Medicine, Brawijaya University–Saiful Anwar Hospital, the Malang City Education Office, the Malang City Health Office, and the Malang City Regional Disaster Management Agency.

Primary data were collected through direct surveys using a checklist. Data collection was conducted through direct observation using two checklists, differentiated by the objects of measurement. The first checklist consisted of 31 items related to school health unit (UKS) facilities, while the second checklist consisted of 21 items related to first aid supplies. The checklists were developed based on a literature review of UKS facilities and first-aid supplies, as well as relevant national standards. However, the available research documentation does not include specific sources for each item, the instrument development process, content validation, instrument pilot testing, observer training, or inter-rater reliability. Therefore, the checklists in this study are treated as descriptive mapping instruments rather than as validated instruments for measuring disaster preparedness or school compliance with specific standards.

Each item was assessed using a dichotomous score. A score of 1 was assigned if the item was found to be available at the time of observation, while a score of 0 was assigned if the item was not found. The assessment only recorded the presence of items at the time of observation. The study did not assess equipment functionality, physical condition, the number of items relative to the school population, supply expiration dates, accessibility, staff competence, emergency procedures, training, simulations, referral systems, or actual response capacity. Thus, the term "available" does not imply that the item is adequate, functional, up to standard, or ready for use.

Data were processed and analyzed using quantitative descriptive methods. Analyses were conducted separately for school health room (UKS) facilities and first aid kit (P3K) supplies. In the item-level analysis, frequency indicates the number of schools possessing each item. At the same time, the percentage is calculated by comparing the number of schools possessing the item to the total of 4 schools observed. The aggregate proportion of UKS facility availability was calculated based on the number of items found compared to 124 observation opportunities, namely 31 items across the four schools. The aggregate proportion of first aid kit completeness was calculated based on the number of items found compared to 84 observation opportunities, namely 21 items across the four schools.

The survey results are presented as frequencies and percentages to provide a detailed overview of the distribution of availability for each UKS facility and first aid kit inventory. Inferential analysis was not performed because the study was descriptive in nature, the sample size was limited, and the schools were selected purposively. Interpretation of the results is limited to mapping the availability of UKS facilities and the completeness of first aid kit supplies at the four partner schools in November 2023.

4. Results and Discussion

4.1 Analysis Results

This section presents a descriptive analysis of the availability of School Health Unit (UKS) facilities and the completeness of First Aid kits at SDN 1 Klojen, SMP Salahuddin, SMPN 3, and SMA Islam in Malang City. The research findings are limited to the presence of items identified during the observations and are not used to assess disaster preparedness, service effectiveness, or the schools' actual response capacity.

4.1.1 Availability of UKS Facilities and Equipment

Table 1. Availability of School Health Unit (UKS) Facilities and Resources at Sample Schools
(n = 4)

No.	Items on the checklist	Number of schools available (n)	Percentage (%)
1	Bed	4	100
2	Cabinet	4	100
3	Table	4	100
4	Chair	4	100
5	Room area $\geq 12 \text{ m}^2$	4	100
6	Bathroom/Toilet	1	25
7	Adequate ventilation	3	75
8	First Aid Supplies	4	100
9	Stretcher	2	50
10	Blanket	4	100
11	Sphygmomanometer	4	100
12	Body thermometer	4	100
13	Body scale	4	100
14	Height Measurer (micrometer)	4	100
15	Handwashing stations/sinks and soap	2	50
16	Center	2	50
17	Bengkak/kidney tray	1	25
18	Antiseptic labeled "red medicine"	2	50
19	Povidone-iodine	4	100
20	Splint	2	50
21	Rolled bandage	4	100
22	Plaster	4	100
23	Elastic bandage (Tensoplast)	3	75
24	Topical preparations labeled "rub-on medicine"	4	100
25	Eucalyptus oil	3	75
26	Sterile gauze	4	100
27	A solution labeled "boorwater"	1	25
28	Eye drops, type not specified	2	50
29	A solution labeled "revanol/rivanol"	2	50
30	Oralit	2	50
31	Paracetamol	4	100

Note: n = number of schools where the item was found; percentage = $n/4 \times 100\%$. The terms "medication" or "solution" follow the labels on the instruments and packaging observed. The active ingredients, concentrations, conditions, and expiration dates of the items were not assessed.

A survey of the availability of UKS facilities and equipment was conducted on 31 items across the four sample schools. The results of the analysis of the frequency and percentage of availability for each item are presented in Table 1. The frequency indicates the number of schools where a particular item was found, while the percentage was calculated using the four schools as the denominator. Of the 124 observation opportunities—that is, 31 items across four schools—90 items were found to be available. Thus, the aggregate availability rate for UKS facilities reached 72.58% (90/124). This rate represents the aggregate result for all items and schools, not the completeness percentage for each school. A total of 16 out of 31 items were found in all schools, including beds, cabinets, tables, chairs, a room with a minimum area of 12 m², first-aid supplies, blankets, a blood pressure cuff, a thermometer, a bathroom scale, a height measuring device, povidone-iodine, roll bandages, adhesive bandages, sterile gauze, and acetaminophen.

In contrast, bathrooms/toilets, a sink, and a solution labeled boorwater were found in only one school (25%). Stretchers, handwashing stations with soap, flashlights, an antiseptic labeled "red medicine," splints, eye drops, a solution labeled "revanol/rivanol," and oral rehydration solution were found in two schools (50%). Adequate ventilation, elastic bandages, and eucalyptus oil were found in three schools (75%). This distribution indicates that the availability of school health room facilities is not uniform across the four observed schools. However, the availability percentage does not reflect the condition, functionality, accessibility, adequacy of quantity, or the school community's ability to use these facilities.

4.1.2 Completeness of First Aid Supplies

Table 2. Completeness of First Aid Kits at Sample Schools (n = 4)

No.	First Aid Supplies	Number of schools available (n)	Percentage (%)
1	Sterile, wrapped gauze	4	100
2	5-cm-wide bandage	2	50
3	10-cm-wide bandage	2	50
4	1.25 cm wide adhesive tape roll	1	25
5	Quick-drying plaster	2	50
6	25 grams of cotton	2	50
7	Triangular cloth/mitela	1	25
8	Scissors	2	50
9	Safety Pin	1	25
10	Disposable gloves	2	50
11	Mask	1	25
12	Tweezers	1	25
13	Flashlight	1	25
14	Eye-washing cup	0	0
15	Clean plastic bags	1	25
16	100 mL of distilled water	0	0
17	Povidone-iodine 60 mL	4	100
18	70% Alcohol	2	50
19	First Aid Manual	1	25
20	Notebook	1	25

Note: n = number of schools where the item was found; percentage = $n/4 \times 100\%$. The term "1.25 cm wide bandage" in the original instrument was adjusted to "1.25 cm wide roll of adhesive tape" based on the nomenclature in Permenakertrans No. PER.15/MEN/VIII/2008.

A survey of the completeness of first aid supplies was conducted at the four sample schools, covering 21 items on the checklist. The results of the frequency analysis and the availability percentages for each item are presented in Table 2. The denominator for each item is four schools, while the aggregate denominator is 84 observation opportunities—that is, 21 items across the four schools.

Sterile gauze pads and 60 mL of povidone-iodine were found in all schools (100%). 5-cm and 10-cm bandages, adhesive bandages, cotton balls, scissors, disposable gloves, and 70% alcohol were found in two schools (50%). 1.25-cm adhesive tape rolls, triangular bandages or slings, safety pins, masks, tweezers, flashlights, clean plastic bags, first aid manuals, notebooks, and first aid kit inventory lists were found in only one school (25%). Eye-wash cups and 100 mL of distilled water were not found in any of the four schools (0%). Of 84 opportunities to observe first-aid kit supplies, 31 items were found to be available. Thus, the aggregate proportion of first aid kit supply completeness reached 36.90% (31/84). The median and mode of the item-level availability percentage were both 25%. These results indicate that many types of first aid supplies were found in only one of the four schools. These values reflect the distribution of availability at the item level rather than the completeness percentage for each school.

4.2 Discussion

4.2.1 Discussion of the Availability of School Health Unit (UKS) Facilities

The research results show that basic UKS facilities have an aggregate availability rate of 72.58%. Beds, cabinets, tables, chairs, a room with a minimum area of 12 m², blankets, blood pressure monitors, thermometers, bathroom scales, and height measuring devices were found in all schools. The availability of these facilities supports the delivery of basic health services in schools; however, their presence alone cannot serve as the sole indicator of UKS quality or effectiveness. School-based health services are also influenced by facility accessibility, service integration, management, and the availability of relevant personnel (Borkowski *et al.*, 2023; Itriyeva, 2024).

Sanitation facilities are not yet evenly distributed. Bathrooms/toilets were available at only one school, while handwashing stations with soap were available at two schools. These findings align with the view that implementing UKS requires infrastructure support to enable the sustainable delivery of health education and health services, and the promotion of a healthy school environment (Dinatha *et al.*, 2023). The provision of facilities must also be accompanied by inventory management and service administration to systematically monitor resource availability (Ristanto & Murtadho, 2023).

Stretchers, splints, and flashlights were found in only two schools. These findings indicate variations in equipment availability across items but do not prove that schools lacking these items have lower response or evacuation capacity. The study did not observe the use of equipment during actual incidents, simulations, or emergency procedures. Therefore, the results can only serve as a basis for inventory mapping and determining priorities for facility inspections at the schools studied.

The term "availability" also needs to be distinguished from "suitability" and "adequacy." The facilities identified are not necessarily in good condition, easily accessible, available in sufficient

quantities, or used in accordance with proper procedures. Gersch *et al.*, (2024) demonstrated that the presence of resources in school-based health services is not always accompanied by standardized service delivery and referral processes. Consequently, this study does not conclude that a high availability percentage indicates schools' readiness or compliance with UKS standards.

4.2.2 Discussion of the Completeness of First Aid Supplies

Sterile gauze pads and 60 mL povidone-iodine were available in all schools, while some other items were available in only one or two schools. Eyewash cups and 100 mL distilled water were not found in all schools. This inconsistency highlights the need for first aid inventory management that includes clear lists of items, quantities, conditions, storage locations, and expiration dates. First aid guidelines specify the contents of a first aid kit as part of initial response support; however, their selection and use must be tailored to the risk context and the first aid provider's competencies (Djäv *et al.*, 2025).

Disposable gloves, scissors, cotton, adhesive bandages, and 70% alcohol were found in only two schools. Masks, tweezers, flashlights, first-aid manuals, notebooks, and kit inventory lists were found at only one school. The completeness of supplies must be accompanied by knowledge regarding the function and limitations of each item. Hands-on training can enhance teachers' knowledge and confidence in handling health emergencies at school (Elizalde *et al.*, 2024). In the Indonesian context, UKS and first aid training also emphasize the importance of integrating the enhancement of teachers' knowledge with the provision of school health supplies (Rosyidah *et al.*, 2025).

Based on Ministry of Manpower and Transmigration Regulation No. PER.15/MEN/VIII/2008, the research checklist includes 21 types of first-aid supplies. However, this regulation governs the provision of first-aid supplies in the workplace; therefore, its application in a school setting must take into account student characteristics, types of hazards, the number of school community members, and the availability of nearby health facilities. Therefore, the percentage of completeness in this study should not be interpreted as a measure of the school's compliance with this regulation.

The aggregate proportion of 36.90% indicates that the availability of first aid supplies remains limited across the four schools observed. However, the study did not assess whether the supplies found were still suitable for use, not expired, easily accessible, or available in sufficient quantities. The study also did not measure teachers' or students' ability to use the equipment. Therefore, the completeness of supplies is not equated with readiness to provide first aid.

4.2.3 Relationship of Findings to SPAB

Findings on the availability of school health units (UKS) and first-aid supplies indicate differences in their distribution across the sample schools in Malang City. School Health Programs are implemented through health education, health services, and the promotion of a healthy school environment, and require collaboration between educational institutions and primary-level health care facilities (Republic of Indonesia, 2023). Within the SPAB framework, UKS facilities and first aid supplies serve as supporting resources but constitute only a small portion of the overall components of a disaster-resilient school.

SPAB encompasses safe school facilities, school disaster management, and disaster risk reduction education. Its implementation requires policies, leadership, resources, hazard mapping, emergency procedures, evacuation routes, early warning systems, training, simulations, and coordination with stakeholders (Amri *et al.*, 2022; Pramesti *et al.*, 2023). Since these aspects were not

measured, the research results cannot be used to determine the level of SPAB implementation or success at the four schools.

Conceptually, the school health system in Japan, known as hoken-shitsu, is managed by yogo kyoyu and includes health services, health promotion, counseling, and support for school emergency planning (Takahashi *et al.*, 2015). This system also incorporates sanitation facilities, diagnostic equipment, and logistics into school health services (Gavari-Starkie *et al.*, 2021). This comparison serves only to provide an international context. It is not used as a measurement standard because regulations, resources, personnel, and the organization of school health services differ between Japan and Indonesia.

This study does not prove that the unavailability of certain facilities directly reduces response capacity, increases injury severity, or prolongs recovery. There were no measurements of injury incidence, equipment usage, response speed, clinical outcomes, simulations, or actual disaster responses. The practical implications of the study's findings are limited to the need for schools to update their inventories, check the condition and expiration dates of supplies, clarify who is responsible for maintenance, and align procurement with guidelines and the school's risk characteristics.

5. Concluding Remarks and Recommendation

This descriptive study, using a cross-sectional approach, aims to map the availability of school health unit (UKS) facilities and the completeness of first-aid supplies at four partner schools in the "Disaster-Resilient Schools" program in Malang City. Data were collected through direct observation in November 2023 using a checklist covering 31 UKS facility items and 21 first aid supply items. This study addresses which items were available and which were not at the time of observation; it does not address the level of disaster preparedness, the effectiveness of school health unit services, compliance with standards, or the schools' actual response capacity. The results show that the aggregate proportion of available school health unit facilities reached 72.58%, or 90 out of 124 observation opportunities. Several basic facilities, such as beds, cabinets, tables, chairs, blankets, blood pressure cuffs, thermometers, bathroom scales, and height measuring devices, were found in all schools. However, some items were not uniformly available, including bathrooms/toilets, handwashing stations with soap, stretchers, splints, and flashlights. The aggregate proportion of first aid kit completeness reached 36.90%, or 31 out of 84 observation opportunities. Packaged sterile gauze and 60 mL povidone-iodine were found in all schools, while eye-wash cups and 100 mL distilled water were not found during the observations. These findings merely indicate the distribution of item availability and do not prove that the available items are in good condition, easily accessible, sufficient to meet needs, or ready for use.

In practical terms, this study provides an initial overview that individual schools can use to update their UKS facility inventories and first aid supplies. Schools are advised to conduct periodic inspections of the presence, quantity, condition, storage location, and expiration dates of each item, and to designate a person responsible for their management. The Education Office, the Health Office, primary-level health care facilities, and the Regional Disaster Management Agency (BPBD) can support the development of clearer inventory guidelines and provide ongoing guidance tailored to each school's risk characteristics. School health room (UKS) facilities and first aid supplies can serve as supporting resources for the School-Based Disaster Preparedness and Response (SPAB) program; however, enhancing school preparedness requires a broader assessment of policies, staff competencies,

emergency procedures, training, simulations, referral systems, accessibility of facilities, and interagency coordination.

This study was limited to four schools selected through purposive sampling; therefore, the results cannot be generalized to all schools in Malang City or Indonesia. The study also documented only the presence of items, without assessing their functionality, condition, quantity adequacy, expiration dates, accessibility, user competence, or responses during emergencies. Furthermore, the sources of each item, content validation, instrument pilot testing, observer training, and inter-rater reliability have not been fully reported. Future research is recommended to involve a broader and more representative sample, use a validated instrument, and assess the condition and accessibility of facilities, the competence of administrators, emergency procedures, simulations, referral systems, and actual response capacity. Comparative studies of school health services in other countries, including Japan's hoken-shitsu system, can serve as learning resources, while accounting for differences in regulations, resources, and the Indonesian educational context.

Statement of Use of Generative AI

During the preparation of this work, the author used generative artificial intelligence tools to support the scientific writing process. Grammarly was used to check grammar, refine writing style, and improve clarity in scientific writing. All interpretations, analyses, and conclusions presented in this study are the sole responsibility of the author.

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