

Enhancing CPR Readiness and Self-Efficacy in Siaga Bencana Berbasis Masyarakat (SIBAT) Volunteer Fishermen: A Health Coaching Intervention Study

Desi Susilawati¹, Bardah Wasalamah², Nova Yustisia³, Imron Rosyadi⁴

¹²³⁴Diploma III Nursing Study University of Bengkulu, Indonesia

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ABSTRACT

Non-fatal drowning is a life-threatening emergency that commonly occurs among fishermen in open water environments. One of the most critical emergency interventions is cardiopulmonary resuscitation (CPR). This study aimed to analyze the effect of health coaching based on Hands -Only CPR on the readiness and self-efficacy of Siaga Bencana Berbasis Masyarakat (SIBAT) volunteers. The research used a quasi-experimental pretest-posttest control-group design with 36 respondents, selected through purposive sampling. Data were analyzed using the paired t-test and the Mann-Whitney test. The results showed a significant improvement in both self-efficacy and readiness after the intervention ($p=0.000$). The mean self-efficacy score increased from 61.83 to 75.61, while readiness improved from 53.81 to 68.36. Furthermore, the intervention group demonstrated significantly higher scores compared to the control group ($p<0.05$). In conclusion, health coaching based on Hands-Only CPR is effective in improving the readiness and self-efficacy of SIBAT Volunteers in the management of near-drowning cases.

Kasus tenggelam non-fatal merupakan kegawatdaruratan yang mengancam jiwa dan lazim terjadi pada nelayan di lingkungan perairan terbuka. Salah satu intervensi kegawatdaruratan yang paling krusial adalah resusitasi jantung paru (RJP). Penelitian ini bertujuan untuk menganalisis pengaruh pembinaan kesehatan (health coaching) berbasis RJP Kompresi Dada (Hands-Only CPR) terhadap kesiapsiagaan dan efikasi diri relawan Siaga Bencana Berbasis Masyarakat (SIBAT). Penelitian ini menerapkan desain kuasi-eksperimental pretest-posttest control-group dengan melibatkan 36 responden yang dipilih melalui teknik purposive sampling. Analisis data dilakukan dengan menggunakan uji-t berpasangan (paired t-test) dan uji Mann-Whitney. Hasil penelitian mengindikasikan adanya peningkatan yang signifikan pada efikasi diri maupun kesiapsiagaan pascaintervensi ($p=0,000$). Rerata skor efikasi diri mengalami peningkatan dari 61,83 menjadi 75,61, sementara tingkat kesiapsiagaan meningkat dari 53,81 menjadi 68,36. Lebih lanjut, kelompok intervensi menunjukkan perolehan skor yang secara signifikan lebih tinggi dibandingkan dengan kelompok kontrol ($p<0,05$). Sebagai simpulan, pembinaan kesehatan berbasis Hands-Only CPR terbukti efektif dalam meningkatkan kesiapsiagaan dan efikasi diri Relawan SIBAT dalam penatalaksanaan kasus hampir tenggelam (near-drowning).

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Corresponding Author:

Desi Susilawati

Diploma III Nursing Study University OF Bengkulu

Jl. Indra Giri No. 4, Padang Harapan, Bengkulu City, Indonesia

Email: desi.s.darmadi@unib.ac.id

Introduction

Maritime accidents pose significant risks to fishermen operating in open waters, leading to serious emergencies, such as drowning. Drowning can quickly progress to respiratory arrest and cardiac arrest, which are life-threatening if victims do not receive immediate help (Bierens et al., 2023; Reizine et al., 2021). Drowning can be classified based on clinical outcomes into fatal and non-fatal drowning (Breindahl et al., 2025). Survivors of non-fatal drowning remain at risk of experiencing various serious complications if they do not receive prompt

management (Zhou et al., 2022). Therefore, early cardiopulmonary resuscitation (CPR) is a crucial intervention to maintain blood flow to vital organs and enhance the victim's chances of survival (Perkins et al., 2021).

Globally, maritime accidents leading to drowning are common. In 2022, there were 2,510 recorded accidents, rising to 2,896 in 2023, reflecting a trend (European Maritime Safety Agency, 2023). Similarly, maritime accidents in Indonesia have shown an upward trend between 2020 and 2022, with 87 incidents in 2020, 100 in 2021, and 108 in 2022 (Kementerian Perhubungan Republik Indonesia, 2023). Global data indicate that more than 236,000 deaths occur annually due to drowning, with 90% of cases occurring in low- and middle-income countries (Centres for Disease Control and Prevention, 2024).

Non-fatal drowning requires rapid initial management, particularly cardiopulmonary resuscitation (CPR), as early intervention significantly improves survival outcomes (Perkins et al., 2021). In marine settings where professional assistance may be delayed, fishermen often act as first responders. Although conventional CPR with rescue breaths remains the standard recommendation for drowning-related cardiac arrest (Panchal et al., 2020), its implementation by laypersons is often limited. Bystanders frequently hesitate to perform mouth-to-mouth ventilation, hygiene concerns, lack of confidence, or inadequate skills. Ohle et al. (2021) reported that lay rescuers can effectively initiate Hands-Only CPR without waiting to confirm a pulse. Based on this evidence and the contextual constraints of maritime emergencies, Hands-Only CPR was adopted in this study. This approach is simpler, easier to remember, and more feasible for community-based rescuers. Previous studies have demonstrated that Hands-Only CPR training can improve willingness to perform bystander CPR, enhance knowledge retention, and strengthen preparedness among lay rescuers (Nas et al., 2022; Uzendu et al., 2021; Ko et al., 2021).

Non-fatal drowning requires rapid initial management, particularly cardiopulmonary resuscitation (CPR), as early intervention significantly improves survival outcomes (Perkins et al., 2021). In marine settings where professional assistance may be delayed, fishermen often act as first responders. However, CPR implementation by laypersons remains limited. The American Heart Association recommends immediate Hands-Only CPR initiation by lay rescuers without waiting to confirm a pulse (Ohle et al., 2021). Although conventional CPR with rescue breaths remains the standard recommendation for drowning-related cardiac arrest (Panchal et al., 2020), Hands-Only CPR was adopted in this study because it is simpler, easier to remember, and more feasible for community-based rescuers. Previous studies have shown that Hands-Only CPR training improves willingness to perform bystander CPR, knowledge retention, and preparedness among lay rescuers (Nas et al., 2022; Uzendu et al., 2021; Ko et al., 2021).

The role of fishermen as first responders can be strengthened through Community-Based Disaster Preparedness volunteer groups (SIBAT), which consist of community members committed to disaster management. However, in practice, volunteers often demonstrate suboptimal readiness and self-efficacy. Previous studies indicate that readiness and self-efficacy can be enhanced through simulation-based training, repeated practice, and hands-on CPR education (Nas et al., 2022; Musiari et al., 2021). Interactive CPR learning methods have also been shown to improve CPR quality and reduce fatigue among laypersons during prolonged resuscitation efforts (Dong et al., 2021).

Recent studies have demonstrated that health coaching interventions can improve self-efficacy, behavioural change, and participants' engagement in health management programs. Nurse-led health coaching has also been shown to strengthen confidence, motivation, and practical skills through individualised guidance and reflective learning processes (Lin et al., 2022; Potempa et al., 2023). Therefore, integrating health coaching into Hands-Only CPR training may provide a more comprehensive approach to improving both preparedness and self-efficacy among community-based disaster volunteers.

Malabero Subdistrict is one of the coastal areas in Bengkulu City where fishing is the predominant occupation, with 207 active fishermen (Malabero Subdistrict Office, 2025). The area has an established SIBAT group consisting of 40 members. Based on interviews, volunteers are primarily involved in rescuing victims from the water, while initial management is often delayed until professional responders arrive. Additionally, volunteers lack comprehensive knowledge of CPR procedures and often feel uncertain about performing the intervention,

leading to delays in early management. Previous studies have demonstrated that CPR training can improve knowledge and practical skills among lay rescuers (Edinboro & Brady, 2022; Daorattanachai et al., 2025). However, most studies still focus on conventional training methods and emphasise skill improvement rather than psychological aspects such as self-efficacy and preparedness (Kahsay et al., 2024). In addition, studies integrating a health coaching approach into Hands-Only CPR training remain limited, particularly among community-based disaster volunteers in coastal areas (Lin et al., 2022; Potempa et al., 2023).

Although previous studies have examined the effectiveness of CPR training in improving lay rescuers' knowledge and skills, most have focused on conventional training methods and have not specifically integrated a health-coaching approach to simultaneously enhance self-efficacy and readiness. These conditions prompted the present study to implement a Hands-Only CPR-based health coaching intervention to examine its effect on improving the readiness and self-efficacy of volunteer fishermen in the initial management of non-fatal drowning. Therefore, this study aimed to analyse the effect of a Hands-Only CPR-based health coaching intervention on the readiness and self-efficacy of volunteer fishermen in the initial management of non-fatal drowning.

Research Methodology

This study employed a quantitative, quasi-experimental design with a pretest and post-test and a control group (Polit & Beck, 2018). The purpose of this study was to determine the effectiveness of a health coaching intervention based on Hands-Only CPR in improving the preparedness and self-efficacy of Community-Based Disaster Preparedness Volunteers (SIBAT) in managing non-fatal drowning victims.

Data collection was conducted after obtaining ethical approval and research permits. The study population consisted of all SIBAT volunteers in Malabero Village. The sampling technique used was purposive sampling, with the following inclusion criteria: being of productive age, able to participate in all training sessions, and willing to serve as respondents (Sugiyono, 2019). The sample size was determined using the formula proposed by Supranto (2016), with a minimum of 16 respondents per group. To anticipate potential dropouts, an additional 10% was added, resulting in 18 respondents per group, for a total of 36 respondents across the intervention and control groups.

Post-hoc power analysis was considered based on the effect size and statistical significance obtained in the study. Post-hoc power analysis was performed using G*Power software version 3.1 based on the obtained effect size and significance level ($\alpha = 0.05$). The analysis indicated that the sample size provided adequate statistical power (>0.80) to detect differences between groups.

The research procedure began with testing the validity and reliability of the preparedness and self-efficacy questionnaires (Amiruddin et al., 2024). Subsequently, a pretest was conducted for both groups. The intervention group received health coaching through Hands-Only CPR training, which consisted of eight stages: establishing trust, assessing, goal setting, educating, demonstrating, practicing and feedback, empowering and reflecting, and action planning (Nofriati et al., 2023). Meanwhile, the control group received standard education regarding Hands-Only CPR through conventional lecture methods. It printed educational materials without a structured health coaching approach, individualized feedback, or follow-up sessions. This approach was intended to compare the additional effectiveness of health coaching-based training with standard educational methods commonly used in community emergency preparedness programs.

The instruments used in this study were a self-efficacy questionnaire and a readiness questionnaire for hands-only CPR. The self-efficacy instrument for hands-only CPR was developed by the researcher based on the General Self-Efficacy Scale (GSES), which has been validated in the Indonesian version by Novrianto et al. (2019), and adapted to the context of hands-only CPR based on Basic Life Support guidelines (Kementrian Kesehatan, 2021). The instrument underwent content validity testing with experts using the Content Validity Index (CVI), construct validity testing using Pearson's Product-Moment correlation, and reliability testing using Cronbach's Alpha. The CVI results showed that all 10 items had CVI values above 0.78. Construct validity

testing showed that all items were valid ($r_{\text{count}} > r_{\text{table}}$), and reliability testing showed that the 10-item self-efficacy instrument had a Cronbach's alpha above 0.6, indicating reliability. The readiness instrument for hands-only CPR was developed based on the Basic Life Support Guidelines of the Ministry of Health of the Republic of Indonesia (2021) and the CPR Knowledge, Attitude, and Self-Efficacy framework used in resuscitation training based on the American Heart Association (AHA, 2020). The instrument was also tested for content validity using the Content Validity Index (CVI) by experts, followed by construct validity testing using Pearson's Product-Moment correlation and reliability testing using Cronbach's Alpha. The CVI results showed that all 21 items had values above 0.78. Construct validity testing indicated that all items were valid ($r > r_{\text{table}}$). Reliability testing also showed that all questionnaire items had Cronbach's alpha values above 0.6, indicating that the instrument was reliable and suitable for use in the study.

The intervention was carried out over two days through intensive training, including lectures, demonstrations, hands-on practice, and health coaching focused on Hands-Only CPR. Each session lasted approximately 60–90 minutes and was facilitated by trained healthcare professionals. In addition, a follow-up session was conducted in the second week to enhance the participants' knowledge retention, skills, and self-efficacy (Ko et al., 2023). After the intervention, a post-test was conducted for both groups. Data were analyzed using the paired t-test for normally distributed data and the Mann–Whitney test for non-normally distributed data (Dahlan, 2014) to determine differences before and after the intervention and between groups.

This study received ethical approval from the Health Research Ethics Committee of STIKES Sapta Bakti with ethical clearance number: 016/D3/KEPKSTIKesSaptaBakti/2025.

Result

Descriptive analysis was conducted to describe respondents' characteristics by gender and age, and to present the results of pretest and posttest measurements for all variables.

Table 1.

The frequency distribution of respondents by gender among SIBAT volunteer fishermen in Malabero in 2025.

Gender	n	Percentage (%)
Male	36	100
Female	0	0
Total	36	100

As shown in Table 1, all respondents were male ($n = 36$; 100%).

Table 2.

Frequency Distribution of Respondents by Age Among SIBAT Volunteer Fishermen in Malabero in 2025.

Age (years)	n	Percentage (%)
20-35	12	33.3
36-60	24	66.6
>60	-	-
Total	36	100

As shown in Table 2, the majority of respondents were aged 36–60 years ($n = 24$, 66.7%), while respondents aged 20–35 years accounted for 12 individuals (33.3%).

Table 3.

Distribution of Self-Efficacy Categories at Pretest and Posttest (N = 36)

Measurement	Category	n	%
Pretest	Low	1	2.8
	Middle	35	97.2
Post test	Middle	11	30.6
	Hight	25	69.4

The descriptive analysis showed that at the pretest stage, the majority of respondents ($n = 35, 97.2\%$) were in the moderate self-efficacy category, while only one respondent (2.8%) was in the low category. Following the posttest assessment, an improvement in self-efficacy levels was observed, with the majority of respondents categorized as high ($n = 25, 69.4\%$), and the remaining respondents in the moderate category ($n = 11, 30.6\%$). These findings indicate an increase in respondents' self-efficacy after the intervention.

Table 4.

Distribution of Pretest and Posttest Readiness Categories (N = 36).

Measurement	Category	n	%
Pretest	Not Ready	33	91.7
	Ready	3	8.3
Post test	Not Ready	4	11.1
	Ready	30	83.3
	Very Ready	2	5.6

The pretest results for the readiness variable indicated that the majority of respondents were categorized as not ready ($n = 33, 91.7\%$), while only three respondents (8.3%) were categorized as ready. In the posttest, a notable shift in categories was observed, with most respondents categorized as ready ($n = 30, 83.3\%$) and two respondents (5.6%) classified as very ready. These findings indicate an improvement in respondents' readiness following the intervention.

Table 5.

Pretest–Posttest Mean Scores of Self-Efficacy and Preparedness in the Control Group (n = 18)

Variable	Pre-test (mean + SD)	Post-test (mean + SD)	p-value
Self-Efficacy	61.78 ± 4.94	74.44 ± 3.26	0.000
Readiness	53.72 ± 4.92	64.11 ± 6.53	0.000

The mean self-efficacy score in the control group ($n = 18$) increased from $M = 61.78$ ($SD = 4.94$) at pretest to $M = 74.44$ ($SD = 3.26$) at posttest, with statistical analysis indicating a significant difference ($p < .001$). Similarly, for the readiness variable, the mean score increased from $M = 53.72$ ($SD = 4.92$) to $M = 64.11$ ($SD = 6.53$), and this difference was also statistically significant ($p < .001$).

Table 6.

Pretest–Posttest Mean Scores of Self-Efficacy and Preparedness for All Respondents (N = 36)

Variable	Pre-test (mean + SD)	Post-test (mean + SD)	p-value
Self-Efficacy	61.83 ± 4.37	75.61 ± 2.98	0.000
Readiness	53.81 ± 4.50	68.36 ± 7.41	0.000

The mean self-efficacy score among all respondents ($N = 36$) increased from $M = 61.83$ ($SD = 4.37$) at pretest to $M = 75.61$ ($SD = 2.98$) at posttest, with the difference being statistically significant ($p < .001$). A significant improvement was also observed in the readiness variable, with the mean score increasing from $M = 53.81$

($SD = 4.50$) to $M = 68.36$ ($SD = 7.41$), indicating a statistically significant difference between pretest and posttest ($p < .001$).

Table 7.
Posttest Differences in Self-Efficacy and Readiness Between Intervention and Control Groups

Measurement	Category	n	%
Pre test	Low	1	2.8
	Middle	35	97.2
Post Test	Middle	11	30.6
	Hight	25	69.4
Variable	Intervention mean + SD	Control mean + SD	p-value
Self-Efficacy	76.78 ± 2.18	74.44 ± 3.26	0.016
Readiness	72.61 ± 5.66	64.11 ± 6.53	0.000

The analysis results showed that at the posttest, the majority of respondents were categorized as having high self-efficacy ($n = 25, 69.4\%$), while 11 respondents (30.6%) were in the moderate category. Furthermore, a comparison between groups indicated that the mean self-efficacy score in the intervention group ($M = 76.78, SD = 2.18$) was higher than that in the control group ($M = 74.44, SD = 3.26$), and this difference was statistically significant ($p = .016$). For the readiness variable, the mean score in the intervention group ($M = 72.61, SD = 5.66$) was also higher than in the control group ($M = 64.11, SD = 6.53$), with a statistically significant difference ($p < .001$).

Discussion

The results of this study demonstrated an increase in volunteers' self-efficacy and preparedness following the intervention in both groups, with greater improvement observed in the intervention group. The improvement in both groups may be attributed to a learning effect during the research process. However, it appears that the practice-based health coaching intervention specifically led to more optimal reinforcement of volunteers' skills and confidence by offering targeted activities. During the health coaching sessions, participants were encouraged to reflect on their potential roles and responses when encountering non-fatal drowning victims in maritime settings. This reflection, along with guided discussion, individualised feedback, scenario-based reflection, and repeated hands-on practice, directly supported volunteers in strengthening their confidence to initiate early CPR and overcome hesitation during emergencies. These findings align with Albert Bandura's self-efficacy theory, which suggests that individuals' beliefs in their capabilities can be enhanced through direct and purposeful learning experiences (mastery experiences) as the primary source of self-efficacy development (Bandura, 2012).

The improvement in the control group may have been influenced by the learning effect of the pretest and the provision of standard Hands-Only CPR education. Although conventional CPR with rescue breaths remains the standard recommendation for drowning-related cardiac arrest (Panchal et al., 2020; Perkins et al., 2021), this study used Hands-Only CPR because it is simpler, easier to remember, and more feasible for lay rescuers. Community members are also often reluctant to perform mouth-to-mouth ventilation due to fear, lack of confidence, or hygiene concerns. In addition, drowning-related respiratory arrest can rapidly progress to cardiac arrest and decreased cerebral and systemic perfusion if not treated immediately (Bierens et al., 2023; Reizine et al., 2021). Therefore, early CPR remains essential to maintain vital organ perfusion, encourage immediate response, and improve survival outcomes in cases of non-fatal drowning (Perkins et al., 2021; Zhou et al., 2022). Early chest compressions are considered better than providing no resuscitation attempt at all. Furthermore, the structured health coaching, individualised feedback, reflective learning sessions, and repeated guided practice provided in the intervention group resulted in greater improvement and additional benefits compared with conventional education in the control group.

The effectiveness of the health coaching approach in this study may be explained by the interactive and participant-centered learning process. Unlike conventional lectures, health coaching encourages active engagement, reflective learning, repeated practice, and individualized feedback, which may strengthen

participants' confidence and readiness in emergencies. These findings support previous studies indicating that coaching-based educational interventions can facilitate behavioral change and improve self-efficacy through collaborative learning and empowerment processes (Lin et al., 2022; Potempa et al., 2023).

Corroborating evidence comes from studies demonstrating that simulation-based and repeated CPR practice significantly improve participants' confidence, practical skills, and self-efficacy (Nas et al., 2022). Interactive CPR training methods have also been shown to improve CPR quality and participant engagement among lay rescuers (Musuari et al., 2021; Dong et al., 2021). Furthermore, a systematic review conducted by Cant and Cooper (2017), reported that simulation-based learning significantly improves participants' confidence, clinical skills, and self-efficacy. This approach allows participants to engage in experiential learning, which is more effective than passive learning methods.

The differences in posttest results between the intervention and control groups indicate that active learning methods involving hands-on practice produce more optimal outcomes in improving preparedness and self-efficacy. This finding is consistent with studies reporting that Hands-Only CPR training that is simple, practical, and repeatedly practiced can enhance lay rescuers' willingness, confidence, and readiness to provide effective first aid (Hooker & Werft, 2021; Ko et al., 2021).

The coastal setting of Malabero Village also contributes to the importance of this intervention. Fishermen are frequently exposed to maritime emergencies and may become the first individuals to encounter non-fatal drowning victims before professional medical assistance arrives. Therefore, improving the preparedness and self-efficacy of community volunteers in coastal areas is essential to strengthen early emergency response capacity and reduce delays in life-saving interventions. Increased readiness and self-efficacy among SIBAT volunteers may also strengthen the pre-hospital Chain of Survival by enabling earlier recognition of emergencies, faster activation of emergency response, and prompt initiation of CPR before professional healthcare providers arrive (Panchal et al., 2020). Improved self-efficacy enables volunteers to overcome psychological barriers, such as fear and hesitation, thereby accelerating access to the victim and reducing the time to first compression. Early CPR is essential in maintaining cerebral and systemic tissue perfusion during cardiac arrest or respiratory compromise associated with non-fatal drowning. Consequently, victims may arrive at emergency departments in better physiological condition and with more preserved tissue perfusion, thereby facilitating further management by emergency nurses and healthcare professionals.

Overall, this study's findings indicate that a health coaching intervention based on Hands-Only CPR is effective in improving volunteers' self-efficacy and preparedness for early emergency management, particularly in non-fatal drowning cases. This intervention not only enhances cognitive aspects but also strengthens practical skills and self-confidence, which are key factors in successful early response in settings with limited access to healthcare services, such as coastal areas.

Study Limitations

Although this study demonstrates the effectiveness of a health coaching intervention based on Hands-Only CPR in improving volunteers' self-efficacy and preparedness, several limitations should be considered when interpreting the findings. First, this study focused on measuring self-efficacy and preparedness as outcomes, without directly evaluating practical CPR skills in real-life situations; therefore, it may not fully reflect the respondents' actual psychomotor competencies. Second, the study's scope was limited to SIBAT volunteers in a single coastal area, potentially limiting the generalizability of the findings to broader populations with different characteristics. Third, the relatively short duration of the intervention and observation period does not allow for assessment of the long-term sustainability of the intervention effects. Therefore, future research is recommended to employ more rigorous experimental designs and incorporate direct observation of practical skills using manikins equipped with objective feedback devices to measure the accuracy and quality of chest compressions, including depth and rate, and conduct long-term evaluations with a broader population to strengthen the external validity of the findings.

Conclusion

The results of this study indicate that a health coaching intervention based on Hands-Only CPR significantly improves volunteers' self-efficacy and preparedness, with greater effects observed in the intervention group compared to the control group. These findings confirm that a practice-based approach is effective in strengthening volunteers' skills and confidence in early emergency management, particularly in non-fatal drowning cases.

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Conflict of Interest

The authors declare that there is no conflict of interest related to the research, authorship, and/or publication of this article.

Credit Author Statement

Desi Susilawati: Methodology, Validation, Formal Analysis, Data Collection; **Bardah Wasalamah:** Conceptualization, Investigation; **Nova Yustisia:** Data Curation, Writing-Original Draft; **Imron Rosyadi:** Writing-Review & Editing, and Project Administration.

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