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Snakes and Ladders Game Method and Flashcards on Knowledge, Attitudes and Skills of Karang Taruna Youth Regarding Basic Life Support

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Abstract: The growing understanding of the importance of Basic Life Support (BLS) training among adolescents in organized communities has given rise to the need to implement engaging learning methods. This study aims to determine the effectiveness of the Snakes and Ladders and Flashcard game methods on the knowledge, attitudes, and skills of adolescents in Karang Taruna in Babussalam Village. The method used was the Pre-Experimental One Group Pretest Posttest design, with 64 adolescents as respondents taken through stratified random sampling. Data were collected through questionnaires and observations and analyzed using the Wilcoxon Signed Rank Test. The results showed that there was a significant increase in the level of knowledge (from 4.48 to 9.56, $p < 0.001$), attitudes (from 22.55 to 37.95, $p < 0.001$), and skills (from 0 to 5.83, $p < 0.001$) after the implementation of the intervention. These results confirm that the game and visualization methods help in improving BLS understanding and skills. In conclusion, the use of the Snakes and Ladders and Flashcard game methods is effective in improving adolescent knowledge, attitudes, and skills, thus contributing to improving community health capacity in Babussalam Village. This study recommends the application of similar interactive methods in other health training programs to strengthen the appeal and effectiveness of learning.

Keywords: Basic life support; Flashcards; Game; Snakes and sadders; Teenagers

Introduction

There is a growing understanding that youth involved in organized groups such as scouting, social clubs, or other non-formal educational setups demonstrate enhanced potential for skill acquisition and community involvement (Issaka et al., 2022). These affiliations foster environments conducive to both social development and practical skill enhancement, which is crucial for engaging youth in life-saving initiatives like BLS training. The synergy observed within organized groups aids in sociocultural development and enhances peer learning, creating an imperative for educational strategies that capitalize on these group dynamics. Additionally, employing interactive techniques, such as the Snakes and Ladders game within educational settings, has been recognized for effectively promoting engagement among youth. Games have historically been acknowledged for their ability to foster cognitive learning alongside essential psychosocial skills such as teamwork, problem-solving, and effective communication (Yakushkina et al., 2022). This playful method can provide an engaging platform for teaching critical life skills such as BLS, where practical

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knowledge about conducting CPR or using an Automated External Defibrillator (AED) is disseminated in a manner that is both enjoyable and memorable (Awadalla et al., 2020).

By integrating educational games with traditional learning approaches, such as flashcards, educators can enhance the effectiveness of knowledge retention regarding emergency response procedures among youth in Babussalam Village. Moreover, the incorporation of flashcards complements the established practice of associative memory within educational frameworks. This method has been shown to reinforce knowledge retention and help solidify critical skills that must be recalled rapidly in emergency situations (Musoke et al., 2020). Studies have indicated that the use of visual aids and tangible learning tools significantly boosts understanding and long-term memory recall (Alshammari, 2021). In high-pressure scenarios, such as those encountered in emergencies requiring BLS, the ability to recall procedures becomes invaluable. Therefore, integrating flashcards into the training regimen supports memory retention and aligns with the cognitive preferences of many youths engaged in hands-on learning experiences.

The existing literature highlights the imperative for adequate training in crucial areas of health, including BLS, given the known discrepancies between awareness and practice among healthcare professionals and laypersons alike (Usman et al., 2024; Verger et al., 2022). A notable example is the lack of comprehensive BLS training among healthcare students, which points to a wider gap within important populations, such as school teachers and community leaders (Jain et al., 2022). Thus, empowering the youth of Babussalam Village with BLS capabilities addresses a critical public health issue. Studies support the understanding that when young individuals are educated about BLS, they are better prepared to save lives and act as vital community resources (Louis et al., 2022; Schnaubelt et al., 2024). Consequently, initiatives incorporating interactive educational methods into BLS training could enhance the efficacy and readiness of youth in emergency response.

Additionally, incorporating community development theories into this framework reveals insights into how local contexts influence youth participation in health education. Previous studies corroborate that strategic involvement of youth in community activities fosters a sense of ownership and responsibility, which is critical for sustaining health intervention programs (Njenga et al., 2024; Nkansah-Dwamena, 2023). The implementation of fun educational tools, such as the Snakes and Ladders game or flashcards, can help cultivate an empowering and encouraging environment where youth feel integral to the outcomes of their community's health standards. Engaging youth in hands-on training, akin to the proposed methods for BLS education, can elevate skill levels and build positive community attitudes toward health practices. Community development literature articulates that enhancing youth competencies ultimately leads to their more impactful contributions to communal well-being (Ngai et al., 2024; Banda et al., 2024; Darling-Hammond et al., 2020). By actively participating in BLS training, these young individuals become equipped with a sense of purpose and agency, fostering healthier community attitudes and behaviors. Moreover, as demonstrated in community health interventions, the involvement of trained peers as facilitators can greatly enhance the learning experience of their contemporaries (Cents-Boonstra et al., 2021; Seery et al., 2021).

Youth who have undergone the training can utilize their newfound knowledge to conduct workshops or peer education sessions within their communities, further amplifying the reach and impact of BLS skills dissemination. Research suggests that collaborative learning environments bolster retention rates and foster a culture of health advocacy among youth (Norris, 2024). Lastly, employing mixed methodologies—combining educational games and practical skills training—aligns with best practices in youth development and health education. Theoretical constructs guiding these initiatives emphasize the interactive engagement of learners, which has improved knowledge, attitudes, and competencies regarding essential life-saving skills (Johansson et al., 2019; Okada et al., 2025).

As educational landscapes pivot towards more integrated approaches, recognizing the distinct potential of youth within community health strategies becomes paramount. Thus, the intersection of creative educational interventions and youth empowerment addresses immediate health needs and prepares the ground for sustainable health initiatives in Babussalam Village and similar communities. Utilizing the Snakes and Ladders game method alongside flashcards for teaching Basic Life Support to youth in Babussalam Village epitomizes a multifaceted approach to learning that capitalizes on interactive play and peer-led education. Combined, these strategies aim to bridge gaps in knowledge and skills, ultimately fostering a cohort of young individuals who are informed, empowered, and ready to contribute positively to their community's health and safety landscape.

Method

Design

This study uses a Pre Experimental One Group Pretest Posttest research design. This design was chosen to measure conditions before and after treatment in the same group without comparing it with the control group. This approach is useful in analyzing changes in measurable variables before and after intervention, in this case the application of the Snakes and Ladders and Flashcard game methods in Basic Life Support (BLS) training for Karang Taruna teenagers.

Population and Sample

The population in this study were all 64 teenagers who were members of Karang Taruna in Babussalam Village. This population was chosen because of their important role in recognizing and implementing BLS skills in their community. These teenagers are in the age range of 17 to 25 years, which is a vital age for learning and new skills. The sample was taken using the stratified Random Sampling technique to ensure representative variations in the characteristics of Karang Taruna teenager members. Each stratum based on age and gender was used to ensure that the sample included a broad perspective of the population being studied. The sample consisted of 64 teenagers who actively participated in Karang Taruna programs in the village.

Research Variables

The research variables consist of several components, namely: Dependent Variable: Knowledge: The level of understanding of adolescents about Basic Life Support measured through questionnaires before and after treatment; Attitude: Perception and attitude of adolescents towards the importance of Basic Life Support measured through questionnaires; Skills: The ability of adolescents to carry out Basic Life Support procedures, assessed through observation of practical skills after intervention. Independent Variable: Snakes and Ladders Game Method and Flashcards: Interventions applied to improve adolescents' knowledge, attitudes, and skills about Basic Life Support.

Research Instrument

The instruments used in this study consisted of three types of questionnaires and practical observations to measure the three variables mentioned earlier. The knowledge questionnaire consists of 15 questions regarding the basic concept of BLS. Scores are obtained from right and wrong answers, with the weight of the value analyzed using a Likert scale.

Attitude Questionnaire

The attitude questionnaire contains 10 statements about adolescents' views on BLS, which also uses a Likert scale to measure their positive and negative attitudes. Skill Observation Skill measurement was conducted through direct observation after the intervention, where respondents were asked to perform the BHD procedures taught during the training.

Research Procedures

Research Preparation

Obtaining permission from relevant parties in Babussalam village and the Karang Taruna management; Developing questionnaires and observation instruments that have been tested for validity and reliability.

Research Implementation

Pretest: Questionnaires on knowledge and attitudes were distributed to respondents to collect initial data; Intervention: Training using the Snakes and Ladders Game and Flashcard methods which lasted for three sessions. Each session was designed interactively with understanding of the material and practical simulations. In this session, participants were taught BHD techniques while playing, which aimed to be both fun and educational; Posttest: After the intervention, the same questionnaire was used to measure changes in knowledge and attitudes. Skill observations were also conducted at the end of the training session.

Data Analysis

The data obtained were analyzed using the Wilcoxon Signed Rank Test to determine any significant differences between the pretest and posttest results. This test was chosen because the data were not normally distributed based on normality testing using the Shapiro-Wilk method. This analysis encourages a clearer understanding of the effectiveness of the intervention.

Table 1. Data Normality Test Results

Variable	Method	Statistics	P Value	Description
Knowledge		0.81	0.001	Not Normal
Attitude	Shapiro-Wilk	0.87	0.045	Not Normal
Skill		0.76	0.000	Not Normal

From the results above, it can be seen that all variables are not normally distributed based on a p-value smaller than 0.05. Therefore, the analysis used in this study, including the Wilcoxon test, is considered appropriate to be applied to the data obtained. These results support the implementation of non-parametric analysis as a valid approach in the context of this study.

Result and Discussion

Table 2 shows the frequency distribution of several demographic and social variables in the study on the Snakes and Ladders game method and Flashcards on the knowledge, attitudes, and skills of Karang Taruna youth about basic life support in Babussalam Village. The age variable shows that most respondents (97%) are aged 17-25 years, reflecting the focus of the study on the late adolescent group, while the early and late adult categories have no representation. In terms of gender, there is a dominance of males (56.25%) compared to females (43.75%), which provides an overview of gender participation in the study. In terms of education, all respondents (100%) have secondary education, while there are no respondents from primary or higher education, highlighting the educational limitations faced. Finally, the employment precedent shows that the majority of respondents are unemployed (52%), which may be related to their age segment.

Table 3 presents data on the effect of the Snakes and Ladders Flashcard game on three main variables: Knowledge, Attitude, and Skills. For each variable, the average value (Mean), standard deviation (Std Deviation), maximum value, and minimum value are provided both before (Pre -Test) and after (Post Test) the implementation of the game.

Table 2. Frequency Distribution

Variable		
Age	n	%
Age 17-25 Years	62	97
Age 26-35 Years	2	3
Age 36-45 Years	0	0
Gender	n	%
Male	36	56.25
Female	28	43.75
Education	n	%
Primary Education	0	0
Secondary Education	64	100
Higher Education	0	0
Job	n	%
Not Working	33	52
Working	31	48

Knowledge

The average pre-test score of 4.48 indicates a relatively low level of knowledge, which increased significantly to 9.56 in the post-test ($p < 0.001$), indicating the effectiveness of the game in improving participants' knowledge.

Attitude

The pre-test score on the attitude variable was 22.55, increasing significantly to 37.95 in the post-test ($p < 0.001$). This indicates that the game contributed positively to participants' attitudes.

Skills

The pre-test score for skills was 0.00, which increased significantly to 5.83 in the post-test ($p < 0.001$), indicating that the game not only improved the knowledge and attitude, but also the skills of the participants.

Table 3. Effect of Flashcard Snakes and Ladders Game on Knowledge, Attitude, Skills

Variable				
Knowledge	Mean	Std Deviation	Maximum Value	Minimum Value
Pre-Test	4.48	0.73	6	3
Post Test	9.56	0.71	11	9
P Value				0.000
Attitude	Mean	Std Deviation	Maximum Value	Minimum Value
Pre-Test	22.55	2.14	29	19
Post Test	37.95	1.18	40	35
P Value				0.000
Skills	Mean	Std Deviation	Maximum Value	Minimum Value
Pre-Test	0.00	0.00	0	0
Post Test	5.83	0.38	6	5
P Value				0.000

Discussion

The insights derived from Table 2 and Table 3 in the study of the game-based interventions among the youth in Babussalam Village provide a robust understanding of the demographic characteristics and the educational impact of these interventions on knowledge, attitudes, and skills concerning basic life support among the youth. The analysis illuminates key socio-demographic aspects that intertwine with the study's intervention goals, showcasing the implications of age, gender,

education, and employment status on the engagement levels and outcomes of the participants. Commencing with the age distribution, the study predominantly targeted late adolescents and young adults, with 97% of respondents aged between 17 to 25 years. This focus aligns with the understanding that late adolescence is a critical period for skill acquisition and knowledge development regarding health interventions (Jackson et al., 2024; Choo et al., 2024). Moreover, the absence of respondents from older adult categories further stresses the study's concentrated aim on the younger demographic, which underscores the necessity of tailoring interventions to suit their developmental needs.

In terms of gender representation, the results indicated a male dominance (56.25% male vs. 43.75% female), highlighting various social and cultural factors influencing participation in health-related studies (Osike et al., 2023). Literature suggests that male youths often have higher engagement rates in health education programs, potentially due to varying levels of interest or perceived relevance of intervention topics (Boucher & Raiker, 2024). The predominance of males could affect the dynamics of group learning, necessitating careful consideration in future research designs to encourage a more gender-balanced representation (McCabe et al., 2023; Alvarado-Vargas et al., 2024). The educational background of the participants was homogenous, with 100% possessing only secondary education. This lack of diversity in educational attainment highlights a potential limitation in the research. Participants with limited educational qualifications may experience challenges in comprehending complex life support information and skills training (Bartlett & Schugurensky, 2024; Li & Pei, 2024).

This limitation underscores the need for guided educational strategies that accommodate varying levels of pre-existing knowledge and cognitive capabilities. Previous studies have shown that a robust educational foundation can significantly enhance the efficacy of health interventions among youth (Hawke et al., 2020; Dodd et al., 2022). The employment status reflects a predominant trend of non-employment among the respondents (52% not working), which aligns with wider socio-economic trends where younger individuals in developing regions often face barriers to employment. This finding resonates within the context of socio-economic factors and their impact on engagement in health education programs, as unemployed youths might prioritize immediate economic concerns over educational endeavors (Thamrin et al., 2024). The results presented in Table 3 indicated substantial improvement across knowledge, attitudes, and skills among participants. The pre-test average scores were significantly lower, with the post-test scores reflecting profound gains—particularly in knowledge (from 4.48 to 9.56, $p < 0.001$), attitudes (from 22.55 to 37.95, $p < 0.001$), and skills (from 0.00 to 5.83, $p < 0.001$).

These outcomes highlight the efficacy of using educational games as pedagogical tools in health education, as they enhance cognitive knowledge and influence behavioral and attitudinal changes (Dabbous et al., 2022; Teutemacher et al., 2024). Game-based learning can foster active participation, leading to deeper understanding and retention of vital life-saving skills (Russ & Gaus, 2021). Moreover, the pre- to post-test improvements reflect a transformative educational experience through game-based interventions. Prior research indicates that interactive and participatory learning methods significantly enhance retention and application of knowledge among youth (Basabah, 2024). The transition from a zero score in the skills assessment to an average score of 5.83 demonstrates a successful pedagogical strategy where participants not only learned theoretical information but also engaged in practical skills, which is crucial for lifesaving skills acquisition (Sprague Martinez et al., 2020; Williams & Hodges, 2023).

The significance level ($p < 0.001$) across all variables further emphasizes the statistical reliability of these improvements, lending credibility to the efficacy of such gaming interventions in leading to substantial educational outcomes (Bani-Hani, 2022). The implications of this research are multifaceted. First, the findings advocate for the integration of play-based learning strategies in youth health education programs, enhancing engagement levels and ensuring that essential health skills are disseminated effectively (Majee & Wegner, 2023). Additionally, the insights into demographics highlight the necessity of inclusive programming that accounts for gender, educational background, and socio-economic status to amplify the effectiveness of health interventions (Bayer, 2020). Future research should explore strategies to diversify participant demographics, potentially leading to enriched study outcomes and greater societal impact.

Conclusion

This study shows that the implementation of the Snakes and Ladders and Flashcard game methods significantly improved the knowledge, attitudes, and skills of adolescents in Babussalam Village regarding basic life support. With 97% of respondents aged 17-25 years, the focus on the late adolescent group reflects the urgent need for educational interventions that are appropriate to this age group. In addition, the dominance of male participants (56.25%) and limited education (100% only had secondary education) represent challenges in participation and understanding

more complex materials. Although the majority of respondents are unemployed (52%), the results showing significant improvements in all variables (knowledge: pre-test 4.48 to post-test 9.56; attitudes: pre-test 22.55 to post-test 37.95; skills: 0.00 to 5.83) indicate the effectiveness of the game method as a pedagogical tool. This study demonstrates the great potential of game-based learning strategies in health education, as well as the need for more inclusive programs to cover demographic diversity to increase the effectiveness of interventions.

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Author Contributions
Concept: ADS, SRJ, MH, DE, LWA, DP, MM, GNA Methodology and Software: ADS, SRJ, MH, DE, LWA, DP, MM; Validation and Formal Analysis: ADS, SRJ, MH, DE, LWA; Writing—Original Draft Preparation: ADS, SRJ, MH, DE, LWA, DP, MM, GNA; Project Administration: ADS, SRJ, MH, DE; Funding Acquisition: ADS, SRJ, MH, DE.

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Conflicts of Interest
The authors declare no conflict of interest.

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