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# Comparison Effectiveness between Online and Offline Method of Health Education in Cirebon, Indonesia

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**ABSTRACT**

Health education is important to know by community to better action in health habit. Several studies related to the comparison of the results of online and offline education have found mixed results, so in this study find out the differences in the results of online and offline education at Mafatihul Huda School, Cirebon, and find best method for conducting health education. This study used 4 treatments, posters and voice notes (POV), power points and voice notes (PPV), videos (VID), and offline (OFL). Total sample is 122 respondents. Subject groups POV 29 respondents, PPV 27 respondents, VID 33 respondents, OFL 33 respondents. Data in this study were collected at the time before and after the intervention and used a questionnaire instrument. In the questionnaire there are 10 questions related to knowledge about health including healthy lifestyle, balanced nutrition, and functional food. There were significant differences in the pre and post test values for the poster & voicenote (p=0.043), video (p=0.001), and offline (p=0.001) methods, but there were no significant differences in the pre and post test scores for the power point & voicenote method (p=0.362). In the poster & voicenote, video, and offline methods there is no significant difference in the difference between the pre and posttest scores of the 3 methods (p=0.054). The poster & voicenote, video, and offline methods have the same effectiveness in increasing respondents' knowledge about health education.



## 1. INTRODUCTION

Health education for adolescents in schools is proven to significantly improve Health-Related Quality of Life [1]. Adolescents have an important role in health habits in the household, so that education for adolescents can influence good habits in the family. Teenagers mostly have access to food choices in the family. Health education obtained in research is expected to be useful for a healthier life. This study uses adolescent subjects at the Mafatihul Huda School Cirebon. Mafatihul Huda School Cirebon is in the Cirebon Regency. Characteristics of students and geographical conditions are expected to represent conditions in Cirebon, West Java.

Health education materials in this study include Clean and Healthy Living (PHBS), balanced nutrition, and functional food. PHBS is all health behaviors that are carried out because of personal awareness so that the family and all its members able to help themselves in the health sector and have an active role in community activities. Clean and Healthy Living Behavior is basically an effort to transmit experiences regarding healthy living behaviors through individuals, groups or the wider community with communication channels as a medium for sharing information [2]. Balanced nutrition is a guideline for Indonesian nutrition. First published in 1995, which were revised and updated in 2014. There are 10 points of balanced nutrition, namely Eat a variety of foods, Eat plenty of vegetables and fruits, Eat high-protein foods (animal or vegetable sources), Eat a variety of staple foods, Limit consumption of sweet, salty and fatty foods, Eat breakfast everyday, Drink enough safe water, Read food labels, Wash hands with soap and running water, Perform adequate physical activity and maintain a normal weight [3]. Functional food plants in Indonesia such as turmeric, ginger, curcuma, aromatic ginger [4], gandaria leaves [5] need to know by students. These food plants contain bioactive components that are beneficial to human health. Public knowledge about local food that has bioactive content to support health is important. Community knowledge is expected to be able to support habit to maintain health.

Long distance education system has been regulated in Indonesia Minister of Education and Culture Regulation No. 109/2013 [6]. Long distance education through various communication media has become more widely used during the Covid 19 pandemic. In delivering educational material online, teachers use several methods, either by video conferencing such as google meet and zoom, or by sharing information via WhatsApp groups. According to previous research [7], it was reported that the media chosen for the most educational methods was WhatsApp, so in this study the WhatsApp application was used as a learning medium. The advantage of delivering material through the WhatsApp application is that the information obtained tends to be stable because the material is downloaded, students then listen without being interrupted due to the signal, many have the WhatsApp application. Methods that can be used include posters and voice notes (POV), power points and voice notes (PPV), videos (VID). These three methods are expected to be able to convey health information to the public properly.

Several studies related to the comparison of the results of online and offline education have found mixed results. Online learning is reported to be less effective [8]. The results of the study [8] show that all participants feel that offline learning is more effective than online learning for various reasons such as offline learning being able to know and feel the situation directly in the learning process, teamwork is better in offline learning, students are more focused on the teacher's explanation delivered in class. The advantages of online learning are time, place and flexible conditions and being able to maintain the teaching and learning process during the Covid-19 pandemic. Weaknesses of online learning are limited interaction between students, network constraints, and student control problems. Besides that, the advantages of offline learning are being able to interact and share directly in class and easily understand the material. The weaknesses of offline learning are inflexible time and place and the risk of transmission [9]. Meanwhile in research [10] found there is no evidence that offline learning works better. Compared to offline learning, online learning has advantages to enhance undergraduates' knowledge and skills, therefore, can be considered as a potential method in undergraduate medical teaching. There are still differences in the results in the effectiveness of online and offline methods, so in this study we will find out the differences in the results of online and offline education at Mafatihul Huda School, Cirebon, and find best method for conducting health education.

***Research Point***

The point of this research are to asses differences in health knowledge before and after intervention, compare online and offline methods in increasing adolescents' knowledge about health, obtain information about the

most effective methods for increasing adolescents' health knowledge.

***Study determination***

This research is an experimental research pre-post test, proportional random sampling. In this study there were 4 treatment groups, namely: poster and voice notes (POV), power point and voicenote (PPV), videos (VID); and offline (OFL). Offline is the provision of education directly face to face using power point. The inclusion criteria for this study were Mafatihul Huda school students aged 14-17 years, physically and mentally healthy, had access to devices and internet data packages, and were willing to participate in the research until it was completed. The exclusion criteria for this study were that respondents did not participate in the intervention until it was finished, did not do the pretest and/or posttest. The independent variable are the type of educational methods and the dependent variable are the value of knowledge before and after the intervention. This research was conducted on March 3 2023 at Mafatihul Huda School, Cirebon.

The initial sample size was 132 respondents, but 10 respondents did not complete the questionnaire so that the total sample became 122 respondents. Subject groups POV 29 respondents, PPV 27 respondents, VID 33 respondents, OFL 33 respondents. Data in this study were collected at the time before and after the intervention and used a questionnaire instrument. In the questionnaire there are 10 questions related to knowledge about health including healthy lifestyle, balanced nutrition, and functional food. This research obtained ethical clearance by the Health Research and Development Ethics Committee Gunung Jati Hospital, Cirebon ethical exemption No.003/LAIKETIK/KEPPKRSGJ/III2023. This research is supported by Funding and Implementation of Muhammadiyah Batch VI Year 2022 Research Grant Number: 1687.043/PMI/I.3/D/2022.

## 2. FINDINGS AND DISCUSSION

***Questionnaire reliability and validity test***

This study used 75 respondents to measure the reliability and validity of the questionnaire. The questionnaire consists of 10 questions regarding PHBS, balanced diet and functional food. The reliability test used Cronbach Alpha test and the validity test used Pearson Correlation.

**Figure 1** Reliability test Cronbach's Alpha

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .739 | 10 |

Figure 1 shows the significance of the Cronbach Alpha value is 0.739 which is greater than 0.6 so that the questionnaire is declared reliable [11].

| | | Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total | Pearson Correlation | .347** | .710** | .610** | .447** | .516** | .499** | .582** | .562** | .588** | .580** | 1 |
| | Sig. (2-tailed) | .002 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | |
| | N | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 | 75 |

**Figure 2** Validity test Pearson Correlation

Figure 2 Q1-Q10 shows the respondent's score at each question point. Figure 2 illustrates the significance of the Pearson Correlation test scores on questions 1-10 all less than 0.05, so that each point in the questionnaire is declared valid [11].

***Normality test***

| Variable | Sig. |
|---|---|
| Pretest POV | 0.288 |
| Posttest POV | 0.000 |
| Pretest PPV | 0.058 |
| Posttest PPV | 0.132 |
| Pretest VID | 0.088 |
| Posttest VID | 0.000 |
| Pretest OFL | 0.383 |
| Posttest OFL | 0.009 |
| Diff POV | 0.518 |
| Diff PPV | 0.114 |
| Diff VID | 0.003 |
| Diff OFL | 0.001 |

**Figure 3** Normality test

Figure 3 illustrates the normality test values by Shapiro Wilk Test. The data that was tested for normality were pretest, posttest, and difference post-pretest values (to describe the increase in knowledge after providing health education). Based on Figure 3, there are various results so that the univariate test uses the median value, bivariate and multivariate tests use non-parametric tests [11].

***Univariate, bivariate, multivariate test***

| Method | Pre Test | Post Test | Diff. |
|---|---|---|---|
| POV | 70 | 90 | 20 |
| PPV | 60 | 70 | 0 |
| VID | 50 | 90 | 30 |
| OFL | 60 | 65 | 5 |

**Figure 4** Median dari nilai pretes, posttest, selisih posttest-pretest pada 4 metode edukasi Kesehatan

Figure 4 shows the median values of the pretest and posttest POV, PPV, VID, and OFL. The diff column is the median of the difference in posttest minus pretest scores [11].

| Method | Sig. |
|---|---|
| POV | 0.043 |
| PPV | 0.362 |
| VID | 0.001 |
| OFL | 0.001 |

**Figure 5** Bivariate analysis before and after intervention (Wilcoxon test)

The results of the bivariate test before and after providing education are shown in Figure 5. In this figure it is known that the POV, VID, and OFL treatments had sig value of less than 0.05, which means that there were differences in values before and after the intervention. The PPV method has sig value of more than 0.05 so that H null is accepted, it means there is no difference in the pre and post test values in PPV method. [11].

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**Test Statistics**[a,b]

| | Selisihnilaipr epost |
|---|---|
| Chi-Square | 5.822 |
| df | 2 |
| Asymp. Sig. | .054 |

a. Kruskal Wallis Test

b. Grouping Variable: Perlakuan

**Figure 6** Mulltivariate analysis POV, VID, and OFL (Kruskal Wallis test)

Because there is more than one method that has a significant difference in value between pre and post tests, multivariate test is carried out. The multivariate test performed was the Kruskal wallis test. In Figure 6 there is sig value of 0.054, it is greater than 0.05 so there is no difference in the three health education methods, namely POV, VID and OFL [11].

***Discussion***

This study is in line with [12]. Previous research [12] shows that online learning in medical education may result in higher post-test knowledge and skills scores than offline learning. It is also more satisfying than offline education. Online learning can be viewed as a potential educational method.

In this research, PPV method does not have different results on the pre and post test. This may be due to the less attractive PowerPoint material. According to [13] interactive video-based PowerPoint media is effective and practical in implementing learning. Learning media PowerPoint can effectively improve students' learning outcomes, especially in science content in fifth grade. Using Interactive PowerPoint Media for Online Learning is effective in increasing student learning scores beyond the minimum standards [14]. Using interactive PowerPoint presentations as a tool that can be used in a variety of ways in classrooms. Students are encouraged to interact directly with the media and participate more actively in online learning activities. PowerPoint presentations affected teachers' presentation skills, students generally believed that teachers demonstrated good presentation skills when teaching using PowerPoint presentation [15].

The study [17] show that the use of Microsoft PowerPoint interactive learning media improves students' reading comprehension. Students will react enthusiastically using this interactive while learning. Students will focus on the material presented by the teacher in this interactive slide show. Based on the data and tests performed, mean class scores for both the experimental and control classes increased after pretests and posttests were performed. The experimental class mean increased pre-test = 56.67 and post-test = 82.00, and the control class mean increased pre-test = 53.00 and post-test = 73.33. Therefore, the use of interactive PowerPoint media in the classroom can improve the reading comprehension of 3rd grade students of SDN Duren Sawit 07 Pagi [16]. PowerPoint can provide visualizations that can grab child's attention. As a result, using PowerPoint media makes children more active and motivated to learn. So PowerPoint could be one of the media that can be used in online learning.

This research shows that the poster method can improve post test scores (Figure 5). The study [18] recommeded posters as a learning medium to improve learning quality and student engagement because highly feasible and relevant.

This results study are different from several studies which have concluded that the offline education method is better than the online method. The results [19] showed that the effectiveness of online education is low because students have difficulty adapting to online education and offline education remains the most preferred form of education. Based on [20], the statistical learning outcomes of students enrolled directly or offline in the teacher training program Body, Health and Recreation at Pattimura University were higher than those of students enrolled indirectly. It conclude that offline method is significantly better than online. On the other hand, the statistical learning outcomes of students who were taught in person or offline were not significantly better than those of students who were taught using blended methods or blended learning. The results showed that learning statistics with face-to-face or offline learning are better than indirect learning, online learning, or mixed learning.

Online learning can affect student's physiology. Previous study [21] found that the learning methods conducted with psychology students have a significant impact. Results achieved by students experience psychological improvements such as anxiety, stress and depression from online learning. Stress is caused by daily learning online, causing a lack of social students with friends. Online learning must provide more internet opportunities compared to offline learning. Economic factors at home are also one of the stressors for students.

The advantages of the offline method are students became more interested because they understood better, interacted with teachers and students in the classroom, and enjoyed the lessons. Students prefer offline learning to online learning [22]. Research [23] found that offline learning was more focused, less interrupted, more reliable, more interactive, and more able to maintain student attention. Online learning may not be the same as offline learning, but in situation of the Covid-19 pandemic, online learning benefits students, saves time and improves academic performance.

***Constrain***

This research was conducted at school not at each student's home. If the research is carried out at home, the result probably same, or maybe different. However, this study provides evidence that online and offline methods can have effect that are not significantly different.

## 3. Conclusion

There were significant differences in the pre and post test values for the poster & voicenote, video, and offline methods, but there were no significant differences in the pre and post test scores for the power point & voicenote methods. In the poster & voicenote, video, and offline methods there is no significant difference in the difference between the pre and posttest scores of the 3 methods. The poster & voicenote, video, and offline methods have the same effectiveness in increasing respondents' knowledge about health education.

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