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ORIGINAL RESEARCH

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UTILIZATION OF MULTIMEDIA TO IMPROVE PIT FISSURE SEALANT PRACTICAL SKILL AMONG STUDENTS IN DENTAL NURSING, YOGYAKARTA, INDONESIA

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ABSTRACT

Background: With an increasing demand of high quality of health services, challenges are addressed to all health providers to improve their skills in providing services to clients. Given that preventive dentistry clinical practice has not been satisfying, providing media as students' guidelines is necessary.

Objective: The study aims to explain the influence of multimedia use in order to improve *Pit Fissure Sealant* (PFS) practical skills of dental nursing students.

Methods: It was a quasi-experimental study with pretest and post-test control group design. Population of the study was selected from dental nursing students in Yogyakarta. A hundred sample was drawn purposively from the population and distributed equally to two groups. The first group was exposed by PFS practice video whilst the second group as control was exposed only by the guidebook.

Results: Initially, students in the control group have better PFS practical score compared to their counterpart in the treatment group. Nevertheless, after the exposure of different media, students in the treatment group demonstrated a better post-test score on their PFS practical skills. The statistical analysis certifies that there was a significant difference in the mean score of PFS practical skills of the students before and after the treatment.

Conclusion: Video as a new media is able to improve the students' motivation in learning than any traditional media such as books. It should be noted however, both printed media (guidebooks) and video only provides one-way communication. Therefore, designing an interactive media using video, which the user can be the sender, not only the receiver, can be considered for further research.

Keywords: practical skills, pit fissure sealant, multimedia, video

INTRODUCTION

With an increasing demand of high quality of health services, challenges are

addressed to all health providers to improve their skills in providing services to clients. A competency-based

comprehensive clinical learning process with student centered learning approach is believed will enable students to achieve the expected outcomes.¹ According to Miller pyramid, clinical competence can be seen from 'shows how and does' stage. *Shows how* can be measured by assessing clinical practice whilst *does* can be assessed by observation, logbook and peers assessment.²

Nowadays, guidebook and video as multimedia aids have been largely used in educational field. Studies found video may improve its users' motivation by providing an efficient way of message delivery including depicting the process clearly^{3,4} whilst guidebook provides a detailed information of concepts, procedures, and examples of teaching materials. Moreover, the nature of a guidebook is conveying the teaching's point of view, administering problem-solving examples and also providing detailed references of a learning subject.⁵

Multimedia in the present study refer to the aids that depicting steps in providing a correct and appropriate *Pit Fissure Sealant (PFS)*. It aims to describe the objectives, benefits, indications, contra-indications of PFS treatment. The provision of multimedia aids is aimed to equip students in dental nursing to better understanding to concept and practice in dentistry science especially *Pit Fissure Sealant (PFS)* in terms of isolation process, dental cleaning, etching, washing, drying etched enamel, mixing, and applying sealant and ended by dental occlusion checking.⁶

Given that preventive dentistry clinical practice has not been satisfying, providing media as students' guidelines is necessary. Therefore, researcher(s) designed a multimedia aid contains of video and guide books as learning tools. The study aims to explain the influence of multimedia use in order to improve *Pit*

Fissure Sealant practical skills of dental nursing students. The findings of the study are expected to contribute to the body of knowledge in dental nursing field and also preparing competent dental nursing graduates who will be able to improve the quality of dental nursing and health services in Indonesia.

METHODS

It was a quasi-experimental study with pretest and post-test control group design. The subjects of the study were students in dental nursing at the second semester in Yogyakarta, Indonesia. A total of one hundred students was drawn purposively from the population and distributed equally to two groups with following inclusion criteria: 1) have never done practice; 2) have never been exposed by PFS practice video before; 3) willing to participate in the study, and 4) present during the study period. The first group was exposed by PFS practice video with 30 minutes duration 2 times a week for 4 months whilst the second group as control was exposed only by the guidebook. No drop out was identified during the study period, thus, the response rate was recorded at 100%. The study received approvals from ethical commission of Politeknik Kementerian Kesehatan Yogyakarta with reference number LB.01.01/KE/XIX/169/2016.

We performed pre-test and post-test assessment to measure the students' skills on *Pit Fissure Sealant (PFS)*. PFS practical skills of dental nursing students are measured using standard format constructed by trained adviser and instructor. PFS comprised of several steps: isolation, teeth cleaning, etching, washing, drying, mixing, applying sealant material, and checking occlusion.⁶ Student performance was scored from zero (0) to hundred (100). Students were declared competent if obtained score more than 70.

Students were described the aims of study and asked for informed consent before participation. Non-differential misclassification bias was acknowledged as limitation of the study. Although it is difficult to control the participants during the study period, however, equal probabilities of events occurred in the treatment and control groups ensured the appropriateness of the results.

RESULTS

Participants of the study comprised of 80 fresh graduates with no working history and 20 civil servants aged 19 to 20. Of those, 87% were female. About half (50.6 and 49.6 percent, respectively) was distributed identically to treatment and control group. Likewise, among 13% of males who involved in the study, 46% was assigned in treatment group whilst the rest

53.8% was assigned as control. Normality test showed that the mean score of pre-test and post-test scores on PFS practical skill was not normally distributed. Therefore, Wilcoxon test was employed to analyze the mean difference of pretest and post-test score of PFS practical skills.

Although being exposed by different kind of media, all participants in the treatment and control group received similar content of teaching materials. Video and guide books both include this following topic: 1) Definition of PFS; 2) Objectives of PFS; 3) Indication and contra-indication; 4) Materials and methods and 5) Procedures of works include instruction, safety and working procedures. Working procedures itself contained of 1) preparation; 2) cavity cleaning; 3) applying sealant and 4) instruction to the patients.

Table 1 Wilcoxon test on pretest and post-test score of PFS practical skills

Groups	<i>Pretest</i>	<i>Posttest</i>	<i>Mean difference</i>	P-value
	Mean (SD)	Mean (SD)	Mean (SD)	
Treatment (video)	68.74 (9.52)	83.2 (4.88)	14.46 (11.48)	0.000
Control (guidebook)	71.92 (7.09)	80.92 (5.5)	9 (7.99)	0.000

Initially, students in the control group have better PFS practical score compared to their counterpart in the treatment group, as it shown in the Table 1. Nevertheless, after the exposure of different media, students in the treatment group demonstrated a better post-test score on their PFS practical skills. The statistical analysis certifies that there was a significant difference in the mean score of PFS practical skills of the students before and after the treatment. The students in the treatment groups improved their score by 11.48 points, higher than the students in the control group (7.99 points) and

confirmed by p-value of 0.000 from Wilcoxon test.

DISCUSSION

The findings of the study confirmed that video transferred the information better than guidebooks. It is shown by the higher mean difference in the practical score of students who exposed by video, compared to those who received the teaching materials from guidebooks only. As it has been mentioned in several media studies, the nature of video as a new media able to improve the students' motivation in learning than any traditional media such as

books.⁷⁻⁹ It draws the users' attention and conveys the teaching materials effectively and efficiently. Given the nature of video as an audio-visual aid, it delivers the message to audience's auditory and visual senses. The information transmitted through the video then absorbed easily by individual's brain and stayed longer in the memory, compared to printed media that relied on visual capacity only.^{10,11}

In many settings, video also has been proven as an important media in learning development process. Although in a short duration, video in this study has been able to help teachers in explaining the teaching materials in a more convenient way. Video directed the students' attention and focus to the subject, and also facilitated the active learning process which eventually will improve the learning outcomes. Studies reported, students who resort to video tutorial as their learning tools obtained higher academic results than their counterparts who do not use this media.^{8,12-14}

It should be noted however, both printed media (guidebooks) and video only provide one-way communication. Students from both groups only performed as receivers since there is no interaction from the designed intervention. As a matter of fact, media studies in many setting revealed that interactive media provide the best result in improving learning outcomes.⁷⁻⁹ As the internet penetrates home and school, and considering that this new medium has become one of the most preferred media for the youngster,^{15,16} perhaps, designing an interactive media using video where the user can be the sender not only the receiver, can be considered for further research.

We realized non-differential bias and misclassification may be occurred in treatment group during given the video, however, it will not interrupt the result since this also may happen at the control

group.¹⁷ The limitation of this study also lies on the short duration of the video displayed and the frequency of exposure. Media theories such as cultivation theory posited that media portrayals and messages might affect the cognitive and behavior of young persons over time by enabling them to acquire new attitudes and behaviors.¹⁸ The cultivation effect is accelerated when viewers amplify their real-life experience by what they view on the media. Therefore, media may affect students' cognitive and behavior if the viewers can relate their real-life experience by what they view on the media. The subjects of the present study only exposed for 30 minutes duration 2 times a week for 4 months. The cultivation effect maybe has not reached into its level in influencing its viewers' cognition and behavior. Thus, perhaps, a more careful analysis of the statistics to make sure the net impact of the media to the study subjects should be taken into consideration.

Media is an important tool in educational process including for practical learning. Nevertheless, it should be noted that media effectiveness in providing assistances to its users also depends on the quality of the provider, the target itself and the content of information given. Providing an adequate information by selecting the right media channel and given by qualified resources is believed will increase the user's knowledge effectively.³

Unfortunately, there was no measurement of participants' knowledge of PFS before and after the treatment. Researchers assumed that all subjects have been selected carefully as those who have never received any teaching materials related to PFS, therefore they were believed had the same level of knowledge related PFS and improvements in their practical skills after the intervention as the net effect of media exposures.

Nevertheless, further research should consider to assess knowledge before and after intervention to make sure that participants' improvement was not due to their prior knowledge and skills.

CONCLUSION

The higher mean difference in the practical score of students who exposed by video--compared to those who received the teaching materials from guidebooks only--has shown the strong point of video in delivering the messages to improve *Pit Fissure Sealant* practical skill among students in dental nursing. Therefore, providing video as a learning tools is considered as an effective method to improve learning outcomes. It should be noted however, both printed media (guidebooks) and video only provide one-way communication. Therefore, designing an interactive media using video, where the user can be the sender not only the receiver, can be considered for further research.

Declaration of Conflicting Interest

None declared.

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Authorship Contribution

All authors contributed equally in this study.

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