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EXPLORING HEALTHCARE-ASSOCIATED INFECTIONS: KNOWLEDGE, ATTITUDE, AND BEHAVIOR OF EMERGENCY NURSES WORKING IN BANDUNG, INDONESIA

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ABSTRACT
Background: Healthcare associated Infections (HAIs) is considered being the most serious patient safety issue in health care settings and nurses in Emergency Department (ED) face greater risk of exposure to infectious pathogens.

Objective: The objectives of this study were to examine knowledge, attitude and behavior towards HAIs of Indonesian nurses working in ED and to examine the relationship among the above three variables.

Method: A cross-sectional study with self-reported survey was conducted at four hospitals in Bandung, Indonesia. The Healthcare Associated Infections Survey consisting of four domains: demographic characteristics, knowledge, attitude and behavior related to HAIs was used. The participants of this study covered 115 nurses.

Results: The mean of overall performance on the knowledge was good 21.23 ±5.173 (range 9-30) and 92.2% of them believed that guideline for HAIs control practice can reduced the risk of infections. The mean score for behavior when practicing infection control was 37.7±5.570 (26-50). Marital status and working hours per week, influenced nurses’ knowledge of HAIs (rs = 0.185, p = 0.048). Work experienced have negative correlation with attitude towards HAIs (rs = -0.196, p = 0.035). Furthermore, type of hospital and working hours per week have been associated with nurses’ behavior towards HAIs (r = 0.191, p = 0.04). There were no significant relationship between knowledge, attitude and behavior towards HAIs.

Conclusion: Even though the majority of ED nurses in Indonesia believe that precautionary guidelines can reduce the risk of HAIs, this study has indicated that nurses’ behavior toward HAIs still insufficient.

Key words: nurses knowledge; attitude; behavior; healthcare-associated infections

INTRODUCTION
Health care-Associated Infections (HAIs) nowadays has become the fifth leading cause of death in acute-care hospitals and considered to be one of the most serious patient safety issues in health
The World Health Organization (WHO) has reported that approximately 1.4 million people suffered HAIs in developing countries, the risk can be up to 20 times greater than in developed countries. The concept of HAI is now extends to not only infections suffered by patients, but also acquired by health-care workers as a result of their work within the health-care system. As the front line of medical care, nearly half of hospital admissions contribute by emergency department (ED) and place it as a high-paced and high-volume health care environment in the hospital. A 5-year surveillance study about occupational exposure to blood borne pathogens in Mexico showed that the majority of HAIs occurred in the emergency room with a total of 34.06% and followed by the internal medicine wards of 16.8% and makes ED the higher proportion of HAIs occurrence than in any other hospital settings.

HAIs in the healthcare setting cause harm for both patients and nurses, and therefore reflect the quality of healthcare. Thus, to reduce the occurrence of HAIs and improve the quality of healthcare services, comprehensive education such as increasing knowledge, attitude and adherence towards standard precaution guideline for nurses are needed. To date, there is limited data about knowledge, attitude, and behavior of infection control practice within ED in Indonesia. This information is necessary to assess whether ED personnel are prepared in preventing HAIs, especially nurses contribute the majority of staffing in hospital. Therefore, the objectives of this study were to examine knowledge, attitude and behavior towards HAIs of Indonesian nurses working in ED and to examine the relationship among the above three variables.

METHODS

Subjects and Setting

A cross-sectional with self-reported survey was conducted from March to May of 2015 at four hospitals conveniently selected from Bandung City region in Indonesia. These hospitals were classified as type A, B and C.

Human Subject Protection

Ethical approvals were obtained from the Institutional Review Board of Hasan Sadikin Bandung General Hospital. Next, the researcher identified eligible participants along with the head nurses of those selected hospitals, then gave the informed consent to the participants. 141 ED nurses were invited and agreed to participate in this study. After signing the informed consent, participants were given the questionnaire.

Instrument

This study used the healthcare-associated infections survey for data collection which comprised of four sessions: (1) demographic and occupational characteristics; (2) knowledge about the risk of acquiring and/or transmitting certain HAIs for/to a patient and standard precautions for prevention; (3) attitude toward precautionary guidelines and perception of the risk of acquiring HAI; and (4) practice of standard precautions.

There were seven questions related to ED nurses’ knowledge towards HAIs. Correct answers receive a score of 1 point and false answer received 0 point, correct answers to each item were based on the review of published literature, policies and guidelines. The attitude section of questionnaire comprises of 4 questions, three questions are related to ED nurses’ attitude toward HAIs. These questions demand a response whether ED nurses agree (scored 1) or uncertain/disagree (scored 0) that precautionary guidelines can reduced the risk of HAIs.
question measured ED nurses’ perception about the risk of acquiring HAI, the possibility response ranging from 1 to 5 scales with 1 meaning no risk and 5 indicating very high risk. Last, the behavior part of questionnaire consists of 14 questions with the scale ranging from 0 to 4, 0 = never, 1 = rarely, 2 = sometimes, 3 = often and 4 = always. The question consists of standard precautions guideline which includes hand hygiene practice, glove-use practice, protective eyewear practice, mask-use practice, sharps handling practice and sharps disposal practice.

**Statistical Analysis**

The differences of mean between knowledge, attitude and behavior by demographic and occupational characteristics were analyzed using Mann-Whitney U-test and Kruskal-Wallis test, independent t-tests and one-way ANOVA. In addition, continuous types of data were analyzed using Pearson and Spearman correlation.

The relationship among knowledge, attitude, and behavior was determined using Spearman correlation. All statistical analysis was performed with statistical software package SPSS for Windows (Version 17.0, SPSS, Chicago, IL) with the \( \alpha \) level set at <0.05 as statistically significant.

**RESULTS**

**Demographic characteristics**

Of the 141 ED nurses agreed to participate, only 115 (81.6% response rate) completed the survey, including 63 (54.8%) nurses from type A hospital, 42 (36.5%) nurses from type B hospitals and 10 (8.7%) nurses from type C hospital. The majority of respondents were female (71.3%) and married (87.8%). Participants’ ages were ranged between 24 to 55 years with the average of 33.97 (SD = 5.724). Their working experience was 1-24 years with the average of 8.58 (SD = 5.294). Their number of working hour per week was 34-78 hours with the average of 47.61 (SD = 5.491).

**Nurses’ knowledge, attitude and behavior toward HAI**

Table 1 summarize the total score of knowledge about HAI which ranged from 9-30 with the mean score of 21.23 (SD = 5.173). Concerning about nurses’ attitude, almost all of the respondents (92.2%) agreed that guideline for HAI control practice can reduce the risk of infections and the majority of them perceived the risk of acquiring HAI as very risky (71.3%). While, the total score for behavior ranged from 26-50 with a mean score of 37.7 (SD = 5.570).

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>%</th>
<th>Mean</th>
<th>Standard Deviation (SD)</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>115</td>
<td></td>
<td>21.23</td>
<td>5.173</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td>106</td>
<td>92.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td></td>
<td>7.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived risk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (no risk)</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 (mild risk)</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 (moderate risk)</td>
<td>9</td>
<td>7.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 (high risk)</td>
<td>24</td>
<td>20.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 (very high risk)</td>
<td>82</td>
<td>71.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior</td>
<td>115</td>
<td></td>
<td>37.7</td>
<td>5.570</td>
<td>26</td>
<td>50</td>
</tr>
</tbody>
</table>
Concerning about nurses’ HAI related behavior, the majority (95.6% and 90.4%) of them always or often place needles in sharp’s containers and always change gloves before going to another patient. In contrast, 93% of nurses always or often recap needles after using. Poor behaviors also reported in hands hygiene measures before wearing gloves, using intravenous cannulation with retractable needle, using syringes with retractable needle and wearing protective eyewear when at direct contact with a patient. See table 2.

Table 2 Nurses’ behavior related to HAI

<table>
<thead>
<tr>
<th>No</th>
<th>Practice</th>
<th>Always n (%)</th>
<th>Often n (%)</th>
<th>Sometimes n (%)</th>
<th>Rarely n (%)</th>
<th>Never n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Placing needles in sharp’s containers</td>
<td>102 (88.7)</td>
<td>8 (7)</td>
<td>2 (1.7)</td>
<td>1 (0.9)</td>
<td>2 (1.7)</td>
</tr>
<tr>
<td>2</td>
<td>*Recapping needles after using</td>
<td>94 (81.7)</td>
<td>13 (11.3)</td>
<td>2 (1.7)</td>
<td>5 (4.3)</td>
<td>1 (0.9)</td>
</tr>
<tr>
<td>3</td>
<td>Changing gloves before going to another patient</td>
<td>84 (73)</td>
<td>20 (17.4)</td>
<td>10 (8.7)</td>
<td>1 (0.9)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>4</td>
<td>Hands hygiene measures before starting the working activity</td>
<td>73 (63.5)</td>
<td>26 (22.6)</td>
<td>15 (13.0)</td>
<td>1 (0.9)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>5</td>
<td>Hands hygiene measures after removing gloves</td>
<td>80 (69.6)</td>
<td>19 (16.5)</td>
<td>13 (11.3)</td>
<td>2 (1.7)</td>
<td>1 (0.9)</td>
</tr>
<tr>
<td>6</td>
<td>Using scalpels with protective shield</td>
<td>81 (70.4)</td>
<td>15 (13.0)</td>
<td>4 (3.5)</td>
<td>9 (7.8)</td>
<td>6 (5.2)</td>
</tr>
<tr>
<td>7</td>
<td>Hands hygiene measures before going to another patient</td>
<td>63 (54.8)</td>
<td>29 (25.2)</td>
<td>22 (19.1)</td>
<td>1 (0.9)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>8</td>
<td>Using syringes with protective shield</td>
<td>69 (59.0)</td>
<td>22 (19.1)</td>
<td>18 (15.7)</td>
<td>5 (4.3)</td>
<td>1 (0.9)</td>
</tr>
<tr>
<td>9</td>
<td>Wearing mask when at direct contact with a patient</td>
<td>40 (34.8)</td>
<td>42 (36.5)</td>
<td>29 (25.2)</td>
<td>3 (2.6)</td>
<td>1 (0.9)</td>
</tr>
<tr>
<td>10</td>
<td>Wearing gloves when at direct contact with a patient</td>
<td>49 (42.6)</td>
<td>30 (26.1)</td>
<td>32 (27.8)</td>
<td>4 (3.5)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>11</td>
<td>Hands hygiene measures before wearing gloves</td>
<td>27 (23.5)</td>
<td>29 (25.2)</td>
<td>46 (40.0)</td>
<td>12 (10.4)</td>
<td>1 (0.9)</td>
</tr>
<tr>
<td>12</td>
<td>Using intravenous cannulation with retractable needle</td>
<td>26 (22.6)</td>
<td>9 (7.8)</td>
<td>26 (22.6)</td>
<td>22 (19.1)</td>
<td>32 (27.8)</td>
</tr>
<tr>
<td>13</td>
<td>Using syringes with retractable needle</td>
<td>22 (19.1)</td>
<td>9 (7.8)</td>
<td>21 (18.3)</td>
<td>30 (26.1)</td>
<td>33 (28.7)</td>
</tr>
<tr>
<td>14</td>
<td>Wearing protective eyewear when at direct contact with a patient</td>
<td>6 (5.2)</td>
<td>5 (4.3)</td>
<td>21 (18.3)</td>
<td>21 (18.3)</td>
<td>62 (53.9)</td>
</tr>
</tbody>
</table>

*Negative behavior

Nurses’ knowledge, attitude and behavior toward HAI by demographic characteristics

Table 3 and 4 presented the score of ED nurses’ knowledge, attitude and behavior by their demographic and occupational characteristics. The results showed there were significant differences in marital status (Z = -2.838, p = 0.005) on knowledge performance among participants. Working hour per week was also found to have positive correlation with nurses’ level of knowledge (r² = 0.185, p = 0.048).

Results showed that negative correlation was found between working experience (r = -0.196, p = 0.035) and attitude, indicating that more experienced nurses have less agreement with the guideline for HAI control practice.
In behavior, significant difference was identified by types of hospital \( (F_{113} = 5.560, \ p = 0.005) \). Further post-hoc analysis indicated that nurses who worked in type A and B hospital \( (M = 37.84, \ SD = 5.178 \) and \( M = 38.88, \ SD = 5.823, \) respectively) have better behavior compared to those who worked in type C hospital \( (M = 32.60, \ SD = 4.274) \). In addition, result also indicated a positive correlation between working hour per week and nurses’ behavior \( (r = 0.191, \ p = 0.04) \). No significant relationships among knowledge, attitude and behavior toward HAIs for nurses who practicing infection control guideline.

### Table 3 Differences of ED nurses’ knowledge, attitudes and behavior by the demographic and occupational characteristics

<table>
<thead>
<tr>
<th>Gender</th>
<th>Knowledge ( Z/\chi^2 )</th>
<th>Attitude ( Z/\chi^2 )</th>
<th>Perceived risk ( Z/\chi^2 )</th>
<th>Behavior ( t/F )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>-0.976</td>
<td>-0.365</td>
<td>-0.687</td>
<td>-1.036</td>
</tr>
<tr>
<td>Female</td>
<td>20.61±4.808</td>
<td>2.88±0.485</td>
<td>4.58±0.663</td>
<td>36.79±6.927</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>21.49±5.320</td>
<td>2.90±0.337</td>
<td>4.66±0.613</td>
<td>38.16±4.915</td>
</tr>
<tr>
<td>Not married</td>
<td>-2.838**</td>
<td>-0.029</td>
<td>-0.320</td>
<td>-0.950</td>
</tr>
<tr>
<td>Type of hospital</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type A</td>
<td>21.51±5.264</td>
<td>2.86±0.435</td>
<td>4.63±0.630</td>
<td>37.84±5.178</td>
</tr>
<tr>
<td>Type B</td>
<td>16.92±5.795</td>
<td>2.85±0.555</td>
<td>4.54±0.776</td>
<td>38.77±4.086</td>
</tr>
<tr>
<td>Type C</td>
<td>18.80±4.894</td>
<td>3.00±0.000</td>
<td>4.20±0.919</td>
<td>32.60±4.274</td>
</tr>
</tbody>
</table>

Note. Analyzed by Mann-Whitney U, Kruskal-Wallis, independent t-test and one-way ANOVA, \( a=\chi^2 \). * \( p < 0.05 \). ** \( p < 0.01 \).

### Table 4 Correlation between continuous variables of demographic and occupational characteristics and ED nurses’ knowledge, attitudes and behavior

<table>
<thead>
<tr>
<th></th>
<th>Knowledge</th>
<th>Attitude</th>
<th>Perceived risk</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.059</td>
<td>-0.086</td>
<td>0.079</td>
<td>0.020</td>
</tr>
<tr>
<td>Working experience</td>
<td>0.004</td>
<td>-0.196*</td>
<td>0.102</td>
<td>-0.024</td>
</tr>
<tr>
<td>Working hour per week</td>
<td>0.185*</td>
<td>-0.079</td>
<td>0.149</td>
<td>0.191*</td>
</tr>
</tbody>
</table>

Note. Analysis using Spearman Correlation test. * \( p < 0.05 \) (2-tailed)

### DISCUSSIONS

**Nurses’ knowledge, attitude and behavior toward HAIs**

This study revealed that nurses’ knowledge was considered to be good with majority of them were aware that tuberculosis and hepatitis B can be transmitted from patient to nurse and vice versa. This finding was not surprising, since tuberculosis were a common infectious disease in Indonesia with the prevalence of 0.4% and the prevalence of hepatitis at all ages were increasing from 0.6 percent in 2007 to 1.2 percent in 2013.\(^{14}\)

In terms of nurses’ attitude, almost all of them agreed that the use of guidelines for HAIs control practices can reduce the risk of infections. There is possibility to attribute these positive attitudes toward HAIs with the high knowledge of ED nurses which has been reported earlier.
This study showed that nurses have overall good behavior toward HAIs. However, there were only few ED nurses who performed infection control practice such as using intravenous cannulation with retractable needle, using syringes with retractable needle and wearing protective eyewear when at direct contact with a patient. This may be attributed to that the unavailability of those equipment in the hospital. The highest adherence was placing needles in sharp’s containers (95.6%), this finding was similar with the study in Kuwait.15 Surprisingly, most of nurses (93%) were still recapping the needles after using which is dangerous. These findings may answer the high incidence of healthcare worker experiencing needle stick accident in Surabaya and Semarang.16

Differences of nurses’ knowledge, attitude and behavior toward HAIs by demographic characteristics

This study indicated a significant difference between the married group and single group regarding knowledge about HAIs. Previous studies stated that younger age had a higher level of knowledge than their older colleagues.17,18 This finding reflected that younger age had a better ability to acquire an up-to-date knowledge, while in older age, the efficacy of their prior knowledge decreased over time.19

Positive correlation also found between nurses’ working hour per week and knowledge. This finding was inconsistent with previous study in Italy which found no significant relationship between length of working time and knowledge.20 Reasonable explanation is that working longer than forty hour per week increased the risk of exposure to infectious pathogens up to 1.2 times higher compared to those who worked fewer hours.21 Our finding may be attributed to that the majority of participants worked more than 40 hours per week and that they perceived themselves at very high risk of acquiring HAIs.

Concerning attitude, this study indicated that more experienced nurses did not believe that precautionary guidelines can reduce the risk of HAIs. This finding was supported by Ferguson22 which showed that some experienced healthcare workers were too sophisticated with the precaution guidelines because they viewed their experience as sufficient for a safer method as the recommended guidelines.

In terms of behavior, this study found significant differences between types of hospital and behavior of nurses towards infection control. Parallel to this finding, previous studies conducted in China has reported that nurses from grade A and B hospitals performed significantly better than those of grade C hospitals.23,24 Barrier for smaller hospitals’ sub optimal behavior towards infection control practices were identified as the lack of financial support, undertrained personnel working in infection control, and shortage of equipment and supplies.25

Limitations and Future Research

This study have several limitations. First, the selection of participating hospitals using convenience sampling and the number of participants was small, therefore limited the generalizability of the findings to other hospitals elsewhere in Indonesia. Second, self-reported response, especially if related to practice, can lead to overestimation, thus resulting a bias. Finally, future research should consider to recruit participants from different regions around the country to represent the cultural and geographical differences comprehensively.

CONCLUSION

The majority of ED nurses have good knowledge, showed positive attitude,
and majority of them perceived the risk of acquiring HAI as very high risk. However, low behavior scores were found in several items.

To monitor adherence of desired behavior, a trained infection control practitioner is crucial for healthcare institution to conduct surveillance, monitoring good behavior of infection control practice and provide ongoing education of healthcare workers. To achieve these objectives, Wright recommended 1.0 to 1.5 infection control practitioner per 100 occupied beds.

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ADVOCACY, SUPPORT FOR RESOURCES, AND THE ROLE OF COMMUNITY LEADER TOWARD MOTHER’S ATTITUDE ON EXCLUSIVE BREASTFEEDING PROGRAM

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ABSTRACT

Background: Indonesia’s Health Law No. 36 year 2009 Section 128 states that every baby has the right to exclusively breastfed from birth for six months. The law also stipulates that during breastfeeding, the family, the government, local governments, and public should support mothers with the provision of time and special facilities.

Objective: This study aims to analyse factors related to exclusive breastfeeding program, especially indicators that can explain advocacy to stakeholders, support for resources and the role of community leader toward mother’s attitude on exclusive breastfeeding program.

Methods: It was a quantitative study employed a cross-sectional approach and involved 185 mothers in Sleman district who have children aged 6-12 months.

Results: Written support in the form of decree significantly contributed to the formation of advocacy factors conducted by exclusive breastfeeding program manager to the village stakeholders, whilst the provision of infrastructure and village fund did not support in creating factor of advocacy. The support from resources and the role of community leader can contribute the provision of infrastructure around 54% whilst mothers’ attitudes toward exclusive breastfeeding devoted a great share to mother’s practice.

Conclusion: Advocacy for exclusive breastfeeding to the village stakeholders is expected to contribute in the form of written support (decree), providing the fund from the village budget, and providing the infrastructure. The support from resources and the role of community leaders influence advocacy and attitude of mothers on exclusive breastfeeding.

Key words: Advocacy, community leader, Attitude, Exclusive Breastfeeding Program
INTRODUCTION

Indonesia’s Health Law No. 36 year 2009 Section 128 states that every baby has the right to exclusively breastfed from birth for six months, unless medically indicated. Furthermore, the law also stipulates that during breastfeeding, the family, the government, local governments, and public should support baby's mother fully with the provision of time and special facilities. The Government has responsibility to provide policies in order to ensure the right of infants to exclusively breastfed.1

The success of health development in achieving strategic objectives and targets is largely determined by the success in creating and preserving health oriented behaviour of the people, including exclusive breastfeeding.2 Basic health research reported, the number of Indonesian women who exclusively breastfed their babies declined from 60 percent in 2010 to 40 percent in 2013.3

Studies found, support from family and community is very important to the initiation and sustainability of breastfeeding. Family members are expected to be well-informed in order to support mother to breastfeed properly4-6 whilst the community may support the mothers by providing support group for improving breastfeeding experience.7

Yogyakarta was selected as the study site because Yogyakarta District Health Office has carried out a program in order to improve breastfeeding coverage. The program comprised of providing health education, facilitating lactation in health services and forming breastfeeding support group in every village. Moreover, the program also designed local regulations and tools to monitor and evaluate the breastfeeding coverage. Nevertheless, the program is challenged by limited human resources such as the number of trained counsellors or facilitators for breastfeeding support group. Not only the quantity, the quality of counsellors sometimes is lacking of creativity and drives the participants to boredom.8,9

Apart from limited resources in Yogyakarta, the program is also challenged by the cultural practice or custom where grandmother or parents/parents in-law applying honey or date into baby’s mouth soon after birth. This common practice is based on Muslim teaching who believed that applying sweet such as honey or date to baby’s mouth will keep the baby warm and prevent them from hypoglycaemia.10 Inadequate information related breastfeeding might prevent mothers from breastfeeding. Coupled with lack of family and community supports, many mothers quit breastfeeding and turn to formula milk because they feel their breast milk is insufficient for their baby.4,5,11,12

This study aims to analyse factors related to exclusive breastfeeding program, especially indicators that can explain advocacy to stakeholders, support for resources and the role of community leader toward mother’s attitude on exclusive breastfeeding program.

METHODS

It was a quantitative study employed a cross-sectional approach where independent and dependent variables were measured at the same period. Population of the study was all mothers in Sleman district who have children aged 6-12 months. Sample was driven proportionally after being cluster randomized with inclusion criteria: mothers aged 20-35 years old, having 6 to 12 months infant, gave birth at health care service (not home birth), able to communicate, willing to participate, having 1-3 children, completed junior high school, normal child births or SC, and residing in Sleman district. Mothers who were seriously ill and gave
birth to babies with disabilities will be excluded from the study. Totally, 185 respondents from 17 sub-districts and 87 villages in Sleman district were involved in the study.

The study has already been approved by ethical committee of Universitas Aisyiyah Yogyakarta with reference number 02/Kep-SAY/II/2016. Variables being observed in this study comprised of exogen variables such as mother’s responses toward advocacy stakeholders, support of resources and the role of community leader in exclusive breastfeeding program in the village. Whilst endogen variables refer to mother’s attitudes towards exclusive breastfeeding program (Y1) which consisted of: (1) breastfeeding practice evaluation, (2) recognize mother’s own health, (3) confidence, (4) breastfeeding support for mother and baby, (5) breastfeeding optimization for mother and baby during breastfeeding, (6) exclusive breastfeeding for the first 6 months of life, and (7) optimal infant feeding.

Advocacy from program manager to stakeholders in the village who are in-charge in exclusive breastfeeding program is seen from respondents’ view as an evaluative response, which can be negative or positive (agree/disagree) towards support from the government as the responsibility of the government in implementing the national policy on exclusive breastfeeding program. The support of resources and the role of community leaders are needed in order to achieve an increase of support for the success that can influence the attitudes of mothers toward exclusive breastfeeding practice.

RESULTS

Advocacy from program manager to village stakeholders

An advocacy to village stakeholders can be defined as successful program with three indicator criteria: (1) written support in the form of decree, (2) provision of infrastructure, (3) village fund. The amount of contribution factors of advocacy towards the indicators can be seen in measurements equations and covariance matrix. Table 1 shows parametric value on the same measurement for every indicator.

With variant error value 1.90 and total variance 4.23, advocacy of exclusive breastfeeding program manager to the village stakeholders can explain the variance of written support in the form of decree. With value of $R^2 = 0.55$, advocacy can contribute written support in the form of decree around 55%, which implies that advocacy is an important factor in breastfeeding program. It is expected, advocacy will be further followed by implementation of local regulation that support breastfeeding program such as longer maternity leave.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>$\text{Error variance}$</th>
<th>$R^2$</th>
<th>Total variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advocacy on exclusive breastfeeding program</td>
<td>Written support in the form of decree</td>
<td>1.90</td>
<td>0.55</td>
<td>4.23</td>
</tr>
<tr>
<td></td>
<td>Provision of infrastructure</td>
<td>3.53</td>
<td>0.01</td>
<td>3.59</td>
</tr>
<tr>
<td></td>
<td>Village fund</td>
<td>2.26</td>
<td>0.12</td>
<td>2.58</td>
</tr>
</tbody>
</table>
The statistical analysis showed variance error for the provision of infrastructure at 3.53, which is lower than total variance 3.59. It means the program manager advocacy on exclusive breastfeeding program can explain variance in the provision of adequate infrastructure. The value of $R^2 = 0.01$ means advocacy of exclusive breastfeeding to village stakeholders may contribute the provision of infrastructure about 1%. Although this contribution is low, yet the provision of infrastructure for community is important to be held as the access to health service may enhance the quality of service provide for the community.\textsuperscript{13,14}

As well as the provision of infrastructure, variance error of village fund also shows a value lower than the total variance 3.59 and $R^2$ value of 0.01, which mean advocacy that is conducted by the program manager of breastfeeding can explain and contribute about 1 percent the variance of village fund. This implies, although the contribution is low, but village fund is necessary to support the exclusive breastfeeding program.

From the three indicators, written support in the form of decree significantly contributed to the formation of advocacy factors conducted by exclusive breastfeeding program manager to the village stakeholders, whilst the provision of infrastructure and village fund did not support in creating factor of advocacy because the loading factor for each indicator was only -0.1 and 0.35. The significance of indicators in supporting the formation of factor can be seen from comparison of the predetermined value between loading factor and value of standard solution. Coefficient of loading factor less than 0.5 showed less significant support in the formation of factor. However, these indicators cannot be thrown away because these indicators need to be improved in order to have higher contribution in forming advocacy factor.

**Resources factors and the role of community leader**

The resources and the role of community leaders comprised of three indicators: (1) facilities and infrastructures, (2) motivations, and (3) actions. Resources and the roles of community leaders toward the indicator can be seen in measurement quotation and covariant matrix. Summary of the analysis are presented in the Table 2.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicator</th>
<th>Error variance</th>
<th>$R^2$</th>
<th>Total Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support of resources and the role of community leader</td>
<td>Facilities and infrastructure</td>
<td>1.83</td>
<td>0.54</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td>Motivation</td>
<td>4.43</td>
<td>0.29</td>
<td>6.42</td>
</tr>
<tr>
<td></td>
<td>Actions</td>
<td>1.73</td>
<td>0.16</td>
<td>2.06</td>
</tr>
</tbody>
</table>

The supports from resources and the roles of community leader can contribute the provision of infrastructure around 54%, shown by the value of variance error (1.83) lower than the total variance (4.00) and R-square equals to0.54. Likewise, it can also explain motivation adequately by showing the value of error variance 4.43, lower from total variance 6.42 and R-square 0.29. With R-square value of 0.16, support from resources and the role of community leaders can contribute to the action around 16%.
Mother’s attitude factors toward exclusive breastfeeding

Attitudes of mothers toward exclusive breastfeeding have seven indicators, namely: (1) breastfeeding practice evaluation, (2) recognizing mother’s own health (3) confidence, (4) breastfeeding support for mother and baby, (5) breastfeeding optimization for mother and baby during breastfeeding, (6) exclusive breastfeeding for the first 6 months of life, and (7) optimal infant feeding. Mother's attitude factors toward exclusive breastfeeding against the indicator can be seen in equivalent measurement and matrix covariance as presented in the Table 3.

With a value of error variance at 1.80 (lower than total variance 1.99) and \(R^2=0.10\), mother's attitudes toward exclusive breastfeeding may contribute ideas, material and human resources around 10% as a part of breastfeeding practice evaluation. Although the contribution is considered low, but evaluation is necessary to ensure breastfeeding practice will gain its optimum benefit both for mother and child.

Likewise, mother’s recognition of her own health also contributes to mother’s attitudes toward breastfeeding. With the value of error variance is 5.32, lower than to the total variance (at 7.36) and also the value of \(R^2 = 0.28\), mother's attitudes toward exclusive breastfeeding can contribute in the recognition of mother’s own health around 28%. Although low, mother’s attitude toward breastfeeding also contributes to mother’s confidence in breastfeeding practice. With the \(R^2\) value only 0.01, mother’s attitude can only explain the formation of mother’s confidence about 1%.

Table 3. Summary of equivalent measurement of mother’s attitude towards exclusive breastfeeding

<table>
<thead>
<tr>
<th>Variables</th>
<th>Indicators</th>
<th>Error variance</th>
<th>(R^2)</th>
<th>Total variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother’s attitudes toward exclusive breastfeeding</td>
<td>Evaluation</td>
<td>1.80</td>
<td>0.10</td>
<td>1.99</td>
</tr>
<tr>
<td></td>
<td>Recognition to mother’s own health</td>
<td>5.32</td>
<td>0.28</td>
<td>7.36</td>
</tr>
<tr>
<td></td>
<td>Self confidence</td>
<td>2.35</td>
<td>0.01</td>
<td>2.39</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding support for mother and baby</td>
<td>2.16</td>
<td>0.19</td>
<td>2.66</td>
</tr>
<tr>
<td></td>
<td>Breastfeeding optimization for mother and baby during breastfeeding</td>
<td>1.23</td>
<td>0.33</td>
<td>1.84</td>
</tr>
<tr>
<td></td>
<td>Exclusive breastfeeding for the first 6 months of life</td>
<td>1.97</td>
<td>0.65</td>
<td>5.65</td>
</tr>
<tr>
<td></td>
<td>Optimal infant feeding</td>
<td>2.28</td>
<td>0.07</td>
<td>2.44</td>
</tr>
</tbody>
</table>

As it has been reported widely, support to mother and baby during breastfeeding is a strong predictor of breastfeeding practice. This study confirmed that mother’s attitude towards exclusive breast-feeding can contribute to the variable of support for mother and baby around 33%. Mothers’ attitudes toward exclusive breastfeeding devoted a great share to mother’s practice. With the value of error variance at 1.97, lower than total variance (5.65) and the value of \(R^2 = 0.65\), mother's attitudes toward exclusive breastfeeding can contribute to the practice of exclusive breastfeeding in the first six months around 65%.

*The relationship of advocacy to village stakeholders and support from resources and the role of community leader*
Results of the analysis showed that there was a positive and significant relationship between advocacy from program manager of exclusive breastfeeding to the village stakeholders and support from resources and the role of community leader. According to Rogers, new ideas, products and social practices spread within a community or society to another. Human resources and the role of community leaders have an important position in the development not only as a manager and agents of development but development itself must be able to provide benefits and improved the lives of human welfare. Therefore the most important development success is the quality improvement so the existence of advocacy which is measured in human development index is considered as necessary.\textsuperscript{15}

**DISCUSSIONS**

Breastfeeding program in Indonesia remains a problem. During the past decade, breastfeeding coverage in many places has not been able to be maintained at national standard’s level. Studies found, many factors influence mothers to breastfeed comfortably, including family, government and community supports. At the macro level, the Indonesia’s government has already published several regulations and laws related to breastfeeding, but the implementations are lacking. Although it has been stipulated clearly in the Indonesian Regulation No 33 year 2012 regarding 6 months exclusive breastfeeding, Health constitution number 36 year 2009, and Law No. 13 of Article 83 year 2003 on Labor, the implementation of 6 months maternity leave has not yet satisfying. Although this article can be used as a strong foundation of jurisdiction and constitutional of 6 months maternity leave, nevertheless, many companies and working places have not complied with the regulation.

At the micro level, maternal psychological factors, factors from the baby itself, environmental factors, and factors of breast abnormalities are the factors affecting exclusive breastfeeding. Mother’s attitudes toward breastfeeding are one of the important factors that should be addressed in the attempts to improve breastfeeding outcomes. In many cases, mothers failed to breastfeed exclusively because of psychological factors that inhibits the breast milk production. The findings of the study found that confidence is needed to increase the mother's attitude toward exclusive breastfeeding. Mother’s confidence can be improved from appreciation of mother’s responsibilities to breastfeed the baby, and mother’s satisfaction knowing that she can fulfil her baby’s need. Improving mothers’ knowledge towards exclusive breastfeeding also necessary since previous studies found unmarried mothers and mothers who do not have access to health facilities are less likely to breastfeed due to their poor knowledge about infant care and infant feeding.\textsuperscript{6,16} Improving mother’s attitudes toward exclusive breastfeeding were also found as contributing factor that improves breastfeeding practice. Supports from peer, health professional and accessibility to services for breastfeeding mothers are the major factors that may improve mother’s attitudes toward exclusive breastfeeding.\textsuperscript{17}

Optimal infant feeding is also associated to mothers’ attitudes toward breastfeeding. Although it can be considered as low support, the contribution of mothers’ attitudes toward exclusive breastfeeding to optimal infant feeding is important to ensure calorie needs can be met for the first six months of exclusive breastfeeding.\textsuperscript{18} Studies found the calorie content of the breast milk starts from 17
kcal / Oz in the colostrum stage and increased by time more than two weeks as a change from colostrum to mature milk and calorie content increases to 2,000 kcal / Oz. Moreover, milk fat is the main source of energy, which provides about half of the calories from breast milk. Fat in breast milk is easily digested because it is formed from droplets of triglycerides. The main carbohydrate in human milk is lactose (98%) that can be quickly broken down into glucose. Lactose is very important for brain growth and the growth of bifidus lactobacillus providing 40-45% of energy breast milk, which is important for the development of the central nervous system. During the first six months of breastfeeding, lactose concentrations increased by approximately 10%, to adapt to the growing need of the newborn. 5,11,19

Mothers’ attitudes toward breastfeeding were also determined by mother’s occupation. This study found, the most common reason for early weaning is mother’s occupation. 20 It was also found, the likelihood to breastfeed is higher among unemployed mothers and mothers who have infants aged less than six months. This implies, occupation become the greatest barrier for mothers to breastfeed their babies. Unfriendly working hours and unavailability of breastfeeding services in the working place perhaps can be a starting point to improve the breastfeeding program.

The success of a health program however, is often inhibited by the lack or absence of support from decision-makers both at national and local level. Due to lack of support, it causes low budget for health programs, lack of infrastructure, the absence of policies favourable to health. Advocacy as a persuasion effort includes activities, awareness, rationalization, arguments and recommendations for further action. Advocacy is the effort or process to obtain a commitment such as written decree as a form of support, which made persuasively using information including the provision of timely and accurate budget. Government regulations or decree from the head of local institution, instructions or social acceptance letter, support of work systems that incorporate health service unit or health program within an agency or development sector including exclusive breastfeeding.

Local institution may contribute in the development of breastfeeding program by providing local regulations and facilities that support mothers to breastfeed exclusively. The present study found, advocacy might contribute about 55% to form local regulation as village stakeholder commitment. Advocacy may enhance the quality of health services provided for the community and also to provide village fund to support the exclusive breastfeeding program. Community leader is also a key person in successful breastfeeding program. Availability of resources and supports from community leader may result in the provision of facilities and infrastructures that is necessary for breastfeeding program. Community leaders also have the capabilities to actively promote the breastfeeding program by motivating community members to support mothers in breastfeeding practice. If the advocacy program successful, the local stakeholders and community leaders support the breastfeeding program, and the resources and facilities to breastfeed are provided, it is expected the exclusive breastfeeding coverage will be elevated.

CONCLUSION

Advocacy for exclusive breastfeeding from program manager to the village stakeholders (midwife) is expected to provide contribution to in the form of written support (decree), providing the fund from the village budget, and
providing the infrastructure. The support from resources and the role of community leaders influence advocacy and attitude of mothers on exclusive breastfeeding.

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ORIGINAL RESEARCH

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 where 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 topics: 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>
<thead>
<tr>
<th>Groups</th>
<th>Pre Test Mean(SD)</th>
<th>Post Test Mean(SD)</th>
<th>Mean difference (SD)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>68.74 (9.5)</td>
<td>83.2 (4.88)</td>
<td>14.46 (11.48)</td>
<td>0.00</td>
</tr>
<tr>
<td>Control</td>
<td>71.92 (7.09)</td>
<td>80.92 (5.5)</td>
<td>9 (7.99)</td>
<td>0.00</td>
</tr>
</tbody>
</table>

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 0.00 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. 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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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,\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.\textsuperscript{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.

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EFFECT OF INVOCATION (DO’A) ON PAIN-COPING BEHAVIORS OF PRIMIPAROUS MUSLIM WOMEN DURING THE FIRST THREE HOURS OF THE ACTIVE PHASE OF LABOR

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ABSTRACT

Background: Pain-coping behavior of primiparous women may have adverse effects on the mother and fetus. In Tangerang, the majority of pregnant women have negative experiences of pain and pain-coping behaviors during labor.

Objective: The purpose of this study was to examine the effect of the invocation (do’a) on pain-coping behaviors of primiparous Muslim women during the first 3 hours of the active phase of labor.

Methods: It was an experimental study with pre-posttest design. Ten primiparous women were randomly selected and assigned to the control and intervention group. Each group consisted of 5 participants. Pain-coping behavior was measured by the Pain Behavior Observation Scale (POBS).

Results: Findings revealed that pain-coping behaviors were increased for those who received the invocation (do’a) with p-value < .05 than those who received the routine care. The effectiveness of do’a could be seen from the average difference of scores of pain-coping behaviors before and after intervention. The intervention group significantly had higher pain-coping behaviors than the control group during three hours of posttest, while controlling for the pretest measure, F (3.24) = 15.68, p< .001.

Conclusions: The invocation (do’a) program for primiparous women during labor is feasible to be conducted, and effective to increase pain-coping behaviors. Therefore, it is suggested to provide this program for primiparous women during the first 3 hours of active phase of labor.

Key words: Invocation (do’a) program, Women in labor, Pain-coping behaviors, Primiparous women.
INTRODUCTION

Pain-coping behaviors is about how pain is expressed by a person.\(^1,2\) Lower pain-coping behaviors may increase the pain and disturb the maternal autonomic functions and cause the release of catecholamine, resulting in which lead to inhibition of uterine activity and prolonged labor,\(^3\) that is the primary reason for increased number of cesarean sections.\(^4\)

In Islam, Allah SWT will give a wisdom and promise a great reward for mothers who are struggling against pain and increasing pain-coping behaviors in childbirth.\(^5,6\) On the other hand, analgesic medications may not be given in several hospitals because the side effects of the analgesics can cause adverse effects on women and infants. Invocation (\textit{do’a}) for women in labor is a non-pharmacological pain management that has been found effective for post-section caesarean and other post-operative pain. It may have some effects on labor pain because spiritual aspect of the patient is very important in increasing pain-coping behaviors and suffering.

Unrelieved labor pains cause the mother to use poor coping strategies that is expressed by a woman.\(^7,8,9\) The responses of pain behaviors include facial expressions, vocalization, bodily movement, breathing control, and communication.\(^1,10\) Primiparous women who were accompanied by their husbands or family were in better condition.\(^11\)

As professionals, nurses must give the holistic care, view person’s body, mind, and spirit to increase pain-coping behaviors. Nurses are obligated to care for the physical, emotional, and spiritual uniqueness of each person.\(^12\) A nurse’s concern of cultural, traditional practices, beliefs, and spiritual importance during pregnancy can increase pain-coping behaviors in order to prepare for birth easily.\(^13,14\) Cultural aspects, religious beliefs and myths are known to influence the perception and interpretation of pain and can play a vital role in a woman’s effort to cope with pain in normal labor. The spiritual aspect of the patient is very important in increasing pain-coping behaviors and suffering.\(^15\) Research has shown that Islamic praying in maternity care is only listening to holy Quran, which is passive.\(^16,17\) However, there are still many kinds of treatment in Islam, such as \textit{sholawat, asmaul husna, do’a, ruqyah}, etc.\(^1\) Therefore, this study aims to examine the effect of \textit{do’a} as one of Islamic treatments to increase pain-coping behaviors of primiparous women in labor.

METHODS

An experimental study with pretest and postest design to examine the effect of the invocation (\textit{do’a}) program on pain-coping behaviors in primiparous women. The subjects were primiparous women who was recruited in the latent phase of labor. The inclusion criteria include: 1) singleton pregnancy (2) have family member, (3) normal gestation for birth (4) normal fetal heart rate (120-160 beats per minute), by using a Doppler stethoscope, (5) latent phase no more than 12 hours, (6) cephalic presentation to control presentation (occiput posterior), (7) without any health complications (mother or fetus), and (8) accompanied by family.

Participants were excluded from the study if mother or fetus had any complications, such as women with asthma, HIV, fetal distress, etc. Women who met the inclusion criteria were randomly assigned to groups using block randomization to control extraneous variable. The homogeneity of the subjects can
minimize the group differences between experimental and control group. The researcher randomly assigned the participants either into the experimental or control groups. Five women in the experimental group received the invocation program from the researcher, and five of women in the control group received the standard care from maternity nurse-midwifery in antenatal clinic and labor room at CHC Pamulang. There was no woman withdrawn from this study. All of women in both groups completed in antenatal and labor room (3 hours after cervical dilation 3-4 cm). This study was approved by Ethical Committee from BBH hospital, Banten, Indonesia.

The intervention program given by researcher includes: breathing (during uterine contractions), and invocation (do’a) for women in labor (during interuterine contraction), accompanied by family during the first 3 hours of the active phase of labor. The program starts when cervical dilation 3 or 4 cm, which was conducted for three times. After birth, at the end of the program, the researcher then interviewed the participants and their families about the perceived helpfulness of the do’a program.

In this regard, the registered nurse or midwife who worked at labor room in the CHC introduces the researcher to the eligible participants. After having 10 women and family that met the inclusion criteria, the researcher then explained about the program. Inform consent was performed prior to study.

Pain-coping behaviors were measured at the start of study before the intervention was started, and then every hour during the program (3 hours after the treatment) with bedside observation.

There were two instruments used for this study, namely the Demographic Data Questionnaire (DDQ) and Pain Observer Behavior Scale (POBS). The DDQ consists of the demographic data and obstetric data. Demographic data includes age, level of education, ethnic, occupation, income (family income), weight, height, and family support in the labor room. Obstetric data like weeks of gestation, problem during pregnancy, membranes ruptured (received artificial rupture of membrane or spontaneous rupture of membrane), characteristic of amniotic fluid, painful menstruation, number of time of receiving antenatal, type of analgesic drug that women received during labor. The researcher observed the pain-coping behavior of women for 4 times; pre-test, 1 hour, 2 hour, and 3 hour from cervical dilation 3-4 cm.

Pain Observer Behavior Scale (POBS) was used to measure pain-coping behavior. It consists of five behaviors of respondents during uterine contraction and relaxation: vocalization, body movement, breathing control, facial expression, and communication. The kinds of behavior that include score 1, 2, and 3 (Likert Scale). This form uses scores from 1 to 3. Bad behavior = 1, middle behavior = 2, and good behavior = 3. The total competence score ranges from 5 to 15. A lower score indicates the respondent displays poor pain-coping behaviors and vice versa.

RESULTS
Demographic and obstetric data

The demographic data and obstetric data were analyzed and described with frequency, mean, and standard deviation (See Table 1).
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Experimental Group</th>
<th>Control group</th>
<th>$x^2/t$ statistics</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age [year; mean (SD)]</td>
<td>23.80 (4.38)</td>
<td>23.20 (4.38)</td>
<td>-21</td>
<td>0.834</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elementary school</td>
<td>1 (20)</td>
<td>1 (20)</td>
<td>2.66</td>
<td>0.44</td>
</tr>
<tr>
<td>Junior high school</td>
<td>2 (40)</td>
<td>4 (80)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior high school</td>
<td>1 (20)</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>1 (20)</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor</td>
<td>1 (20)</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctoral</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Javanese</td>
<td>2 (40)</td>
<td>2 (40)</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Minangnese</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sundanese</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Betawinese</td>
<td>3 (60)</td>
<td>3 (60)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malayunese</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housewife</td>
<td>3 (60)</td>
<td>4 (80)</td>
<td>3.14</td>
<td>0.208</td>
</tr>
<tr>
<td>Unemployed</td>
<td>-</td>
<td>1 (20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>2 (40)</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private (no government)</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income real [Mean: (SD)]</td>
<td>3,600,000 (2,678,619)</td>
<td>3,300,000 (1,643,167)</td>
<td>-0.217</td>
<td>0.836</td>
</tr>
<tr>
<td>Income (family) per month</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; Rp 2,710,000</td>
<td>3 (60)</td>
<td>2 (40)</td>
<td>5.20</td>
<td>0.74</td>
</tr>
<tr>
<td>Rp 2,710,000-5,000,000</td>
<td>-</td>
<td>3 (60)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; Rp 5,000,000</td>
<td>2 (40)</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight [Mean: (SD)]</td>
<td>79.60 (7.36)</td>
<td>78.20 (6.76)</td>
<td>-0.313</td>
<td>0.76</td>
</tr>
<tr>
<td>Height [Mean: (SD)]</td>
<td>157.60 (5.27)</td>
<td>158.20 (7.72)</td>
<td>.143</td>
<td>0.88</td>
</tr>
<tr>
<td>Family support during the 3 hours of the study in the active phase of labor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>1(20)</td>
<td></td>
<td>6.66</td>
<td>0.083</td>
</tr>
<tr>
<td>Mother in law</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female relative</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Husband</td>
<td>1(20)</td>
<td>5(100)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother, husband, mother in law</td>
<td>1(20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother and husband</td>
<td>2(40)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The hypothesis of the invocation (do’a Islamic) program that would be effective for increasing pain-coping behavior was supported. The repeated measure of Anova analysis of covariance showed that the intervention group had significantly higher pain-coping behavior than the control group during 3 hours posttest, while controlling for the pretest measure, $F (3.24) = 15.68$, $p < .001$, effect size = .66, a power = 1.000 (see figure 1). Independent t-test of group differences at each data point presents that the intervention group had effectively increase pain-coping behavior scores at each posttest, compared to the control group; first posttest, $t = -3.53$, $p < .05$; second posttest, $t = -3.20$, $p < .05$; third posttest, $t = -4.53$, $p < .05$. It can be said that the do’a Islamic program is one strategy that can promote the way to increase pain-coping behaviors for active phase of labor.
Table 2. Frequencies and percentages of obstetric data for experimental and control group (n=10)

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Experimental Group</th>
<th>Control group</th>
<th>X²/t statistics</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>weeks of gestation age in Health Teaching [Weeks, Mean: (SD)]</td>
<td>1022 (0.00)</td>
<td>32.20(0.44)</td>
<td>1.000</td>
<td>.347</td>
</tr>
<tr>
<td>Health problems during this pregnancy (No)</td>
<td>5 (100)</td>
<td>5 (100)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(Yes)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Membranes ruptured (No)</td>
<td>4(80)</td>
<td>5(100)</td>
<td>0.476</td>
<td>0.49</td>
</tr>
<tr>
<td>(Yes)</td>
<td>1(20)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Painful menstruation (No)</td>
<td>5(100)</td>
<td>3(60)</td>
<td>2.50</td>
<td>.114</td>
</tr>
<tr>
<td>(Yes)</td>
<td>2(30)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Number of time of receiving antenatal care [Mean: (SD)]</td>
<td>10.40 (3.91)</td>
<td>10.60(2.30)</td>
<td>0.99</td>
<td>0.924</td>
</tr>
<tr>
<td>Type of analgesic drug that women received during labor</td>
<td>5 (100)</td>
<td>5(100)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>None</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Pethidine (IM).........mg</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Morphine (IM).........mg</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Pethidine (IV)..........Mg</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Morphine (IV)..........Mg</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Received artificial rupture of membrane No</td>
<td>4(80)</td>
<td>2(60)</td>
<td>3.143</td>
<td>0.208</td>
</tr>
<tr>
<td>Yes -before study</td>
<td>1(20)</td>
<td>3(60)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- during study</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- after study, in active phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- second stage of labor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous rupture of membranes No</td>
<td>1(20)</td>
<td>2(40)</td>
<td>4.33</td>
<td>0.36</td>
</tr>
<tr>
<td>Yes-before study</td>
<td>1(20)</td>
<td>1(20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- during study</td>
<td>1(20)</td>
<td>1(20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- after study, in active phase</td>
<td>3(60)</td>
<td>1(200)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- second stage of labor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Characteristic of amniotic fluid Clear meconium</td>
<td>3(60)</td>
<td>3(60)</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Mild meconium</td>
<td>2(40)</td>
<td>2(40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thick meconium</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gestational age at birth [Mean: (SD)]</td>
<td>40.20 (0.44)</td>
<td>39.60(0.89)</td>
<td>-1.342</td>
<td>0.217</td>
</tr>
<tr>
<td>Apgar Score at 1 minute [Mean: (SD)]</td>
<td>9.00(0.00)</td>
<td>8.60 (0.54)</td>
<td>-1.633</td>
<td>0.141</td>
</tr>
<tr>
<td>Apgar Score at 5 minutes [Mean: (SD)]</td>
<td>10.00(0.00)</td>
<td>9.60 (0.54)</td>
<td>-1.633</td>
<td>0.141</td>
</tr>
<tr>
<td>Baby weight [Mean: (SD)]</td>
<td>3288(395.56)</td>
<td>3100(380.78)</td>
<td>-0.766</td>
<td>0.466</td>
</tr>
</tbody>
</table>

Table 3 Means and standard deviations of pain-coping behavior by group

<table>
<thead>
<tr>
<th>Data points</th>
<th>Experimental</th>
<th>Control</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Pre-test</td>
<td>8.20</td>
<td>0.44</td>
<td>8.40</td>
</tr>
<tr>
<td>First hour posttest</td>
<td>9.80</td>
<td>0.44</td>
<td>8.80</td>
</tr>
<tr>
<td>Second hour posttest</td>
<td>10.00</td>
<td>0.70</td>
<td>8.80</td>
</tr>
<tr>
<td>Third hour</td>
<td>11.20</td>
<td>1.09</td>
<td>8.80</td>
</tr>
</tbody>
</table>
DISCUSSIONS

Findings of this study showed that there was significant differences in pain-coping behaviors between the experimental and control group after receiving the program in the first 3 hours of active phase of labor. This was the first study to examine the do’a Islamic program integrated with nursing intervention.

Participants in the experimental group conducted do’a and breathing for 3 hours, and found that helpful for increasing pain-coping behaviors, but the opposite result for the control group. The groups of the study were homogeneous and did not find any confounding variables. This finding is consistent with a seven previous study. The researchers revealed that a listening to holy Quran can decrease pain and increase pain-coping behaviors during labor and post caesarean section. The results of this study supports the endorphins releasing theory indicated that concentration by focusing on God (Allah in Islam) can create harmonization and release endogenous opioids (endorphin, encephalin, dynorphins, etc.) in the hypothalamus, which can increase serotonin and production of the neurohormone, endorphins; make the feeling of calm, relief pain, and increase the pain-coping behaviors. Physiological and sociocultural factors, and fully understanding about spirituality are very needed during childbirth. This present study applied all those factors, like breathing that increases blood flow-improved O2; family support increases confident, reduces fear-anxiety; and do’a can make a good relationship with God (Allah), therefore all of those can increase pain-coping behaviors. Spiritual understandings give a sense of purpose and meaning of life. Nurses on this point are able to expand their nursing practice through praying, persons are taught to pray and stay to get full of God's love.

There were several limitations in this study. The assumption of equality of variance was not met statistically. The
generalization of the findings may be limited due to the small sample.

CONCLUSION

This study has shown that do’a Islamic integrating nursing intervention can increase pain-coping behaviors in the active phase of labor. It is recommended for nurses and midwives to provide this program to increase pain coping behavior of women in labor. The future study is recommended to examine this invocation program and consider to: 1) start testing program in the latent phase, 2) continue conducting the program until baby is born, 3) test the program by comparing multiparaus and primiparaous women.

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Dear Editor,

“Complex role in complex times” that is what nurse managers have as the one on the most key roles in the hospital.¹ They are not just about managing staff schedules, but also need to have a vision and able to inspire them.² Thus, competent nurse managers are needed. Research suggests that employees and employers are looking for similar characteristics or personality traits in their leaders. Personality trait refers to the dimensions of individual differences in tendencies to show consistent patterns of thoughts, feelings and actions.³ Personality trait seems able to explain why a person acts the way he/she does when in a leadership position. Research aggregated the results of 222 correlations contained in 73 studies of personality and leadership performance by involving 25,000 managers from every level in organizations across every industry sector.⁴ There were four of the five dimensions of the big five personality were significantly correlated with leadership emergence and effectiveness with adjustment / emotional stability as the best predictor, and agreeableness as the weakest predictor.⁴ Scholars who believe in data, these findings definitively indicate that personality predicts leadership behaviors across all organizational levels and industry sectors, and does so more powerfully than any known alternative.⁵

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Personality traits relate to leader behaviors to a greater extent and less ambiguously than earlier reviews had suggested.\(^6\)

However, although there are clear evidences in examining the relationship between personality and leadership or managerial behavior, it is also important that there are cons about the degree to which personality is related to managerial or leadership behavior. Literature indicates that personality traits cannot be concluded to determine leadership with some considerations: (1) it is impossible to find one specific personality trait that characterizes leaders and (2) it is impossible to isolate a number of traits, which combined, explain leadership.\(^7\)

Thus, it is failed to investigate a clear relationship between personality and leadership. It might be other indications that traits work with other factors in the leadership or managerial behavior.\(^5\)

Study investigated the relationship between personality and transformational leadership, and now some agreement that there may be five super-traits (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience) are related to managerial or leadership behavior. But, it is important to note the effect sizes were not large.\(^5\)

Another study emphasized that “one should be careful in generalizing our findings on the relation of traits to leadership perceptions to other areas of leadership.”\(^6\) The findings could not be directly concluded that there are traits that would generally predict the performance of a leader’s work group or organization, nor do they imply that there are certain types of leadership behaviors that will generally produce superior performance.\(^9\)

On the other hand, the main issue in management research is what kind of behavior managers exhibit and how behavior influences the outcome of the organization. Why leaders behave the way they do adheres to a general issue in psychology, the relationship between personality and behavior. It is not a burning issue in leadership.\(^5\) Additionally, there is no evidence to support that managers are primarily recruited based on their personality traits. Managers are not recruited or promoted based on their personality in formal organizations. Managers are hired primarily due to their formal competence and previous merits.\(^10\)

Finally, the correlation between personality trait and managerial or leadership behavior remains inconclusive. However, it is agreed that personality cannot be excluded from leadership and management.

**REFERENCES**


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