

*TMR Integrative Nursing***The integration of integrated management of childhood illness into the pediatric nursing course for associate degree nursing students in aceh, Indonesia**

Wirda Hayati^{1*}, Soep¹, Dewi Marianthi¹, Tantut Susanto²

¹Nursing Program of Health Polytechnic Ministry of Health Aceh, Aceh, Indonesia; ²Department of Community, Family, and Geriatric Nursing, Faculty of Nursing, Universitas Jember, jember, Indonesia.

***Corresponding to:** Wirda Hayati, Nursing Program of Health Polytechnic Ministry of Health Aceh, Aceh, Indonesia. E-mail: wirda_hayati@yahoo.com.

Highlights

Integrated Management of Childhood Illness (IMCI) suitable into nursing course, especially in pediatric subject. Before into the IMCI in pediatric nursing subject must do mapping of materials from the pediatric subject. That is to avoid overlapping material dan to efficiency and effectiveness to reach the goals of study. IMCI learning by the method of study guide using module has significant influence towards the increase of IMCI knowledge, procedural knowledge, attitude, and practice scores. Active learning program needs to be designed for students to assist their studying and achieve the learning objectives independently.

Abstract

Background and aims: Associate degree nursing students as future nurses must have the competency to perform IMCI (Integrated Management of Childhood Illness) which can be achieved by incorporating IMCI learning during the college study. Currently the IMCI learning for associate degree in nursing program in Aceh is still conducted conventionally which takes two meetings of a hundred minutes with IMCI chart as the only taught material. Some of the students obtain IMCI practical study experience at public health centers while others do not have any experience. Thus, there needs to be a model of IMCI learning integration into a course, and that is pediatrics nursing course. Therefore, the aimed this study was to identify the model of IMCI learning integration into the pediatrics nursing course. **Methods:** The design of the research is the randomized pretest-posttest control group design. For the quantitative study was 74 people (37 in the control group and 37 in the intervention group). The intervention in this study is learn of IMCI with study guided method used module. **Results:** The IMCI knowledge, procedural knowledge, attitude and practice scores were higher after IMCI learning by study guide method compared to IMCI learning by conventional method using IMCI chart. The higher the IMCI knowledge score, the higher the IMCI practice score. **Conclusions:** IMCI learning by the method of study guide using module has significant influence towards the increase of IMCI knowledge, procedural knowledge, attitude, and practice scores. Active learning program needs to be designed for students to assist their studying and achieve the learning objectives independently. **Keywords:** IMCI, pediatric nursing, knowledge, attitude, practice

Competing interests:

The authors declare that there is no conflict of interest.

Abbreviations:

IMCI, Integrated Management of Childhood Illness.

Acknowledgement

None

Citation:

Wirda Hayati, Soep, Dewi Marianthi, *et al.* The integration of integrated management of childhood illness into the pediatric nursing course for associate degree nursing students in aceh, Indonesia. *TMR Integrative Nursing*, 2020, 4(4): 125-132.

Executive Editor: Xu Tian.

Submitted: 19 February 2020, **Accepted:** 12 January 2020, **Online:** 09 August 2020.

Introduction

The disease series in children usually emerges with more than one signs and symptoms which makes the disease treatment more complicated and requires several combined therapy [1]. The survey results of childhood illness treatment in several health service centers revealed that many cases were not examined and handled properly. Parents were not informed about the condition of and treatment for their children. In developing countries, diagnostics tools such as radiology and laboratorial services are insufficient or even unavailable, and medicines and tools are limited [2].

This condition causes health workers at first health service facilities to hardly have opportunities to perform complex treatment procedures, urging children in critical condition to be referred to bigger hospitals. In consequence, the children cannot be treated as quickly as they are supposed to because of the referral process, and the disease becomes more severe [1, 3].

Handling childhood illness and the possible situations must be done in an integrated manner through Integrated Management of Childhood Illness (IMCI). IMCI implementation in public health centers is one of the responsibilities of health workers including the nurses. It is expected that a person has had an IMCI competency before becoming a health worker (a nurse), so they can apply it well when they work. Students of nursing who are still studying in colleges are in the stage of competency development for future nurses. IMCI learning during college study will prepare them with strong basic knowledge so they will be more competent and feel more confident after graduation and becoming a nurse [1]. To streamline the IMCI competency achievement for associate degree nursing students, then the model of IMCI learning process integration into existing courses needs to be considered. One of them is the pediatrics nursing course. This course focuses on treatment for child patients who are less than one to eighteen years old and are not married [4].

The research by Al Araimi (2017) about perceived impact of pre service Integrated Management of Childhood Illness to 110 nursing students indicated that there was a significant impact of pre-service IMCI training for nursing students on their capability in examining cases and treatment skill [5]. During study period, nursing students as future health workers need to receive IMCI study materials and effective teaching techniques. Hence, the IMCI competency can be mastered well by the students which will eventually produce competent nurses in IMCI. Teaching nursing students of IMCI competency can be fulfilled by integrating IMCI into existing courses. However, currently the IMCI subject is taught separately from other courses and integration of IMCI in the courses has not been available. Therefore, the objective of this research

was to identify the efficacy of IMCI integration into the pediatrics nursing course.

Method

Design of study

This research applied experimental method with the randomized pretest-posttest control group design. The selection of research subjects was done randomly. Treatment was only done to intervention group, while the control group did not receive the experimental treatment. The result of pretest and posttest was assessed in both groups.

Intervention

The research intervention started with knowledge, skill, and attitude assessment about IMCI. Next, the facilitators taught IMCI in classes by the method of study guide using module. After that, the reassessment of IMCI knowledge, skill and attitude was done. After intervention by learning in class was conducted, then practice in public health centers was executed to apply the result of IMCI learned in class.

Research site

The research site was the associate degree in nursing study program in Aceh and the IMCI practice was executed in four public health centers. The researchers tried to control the research condition by: first, differentiating the treatment between the intervention group and the control group. In the intervention group the researchers applied the IMCI learning by the method of study guide using module, whilst for the control group by the conventional method using IMCI chart.

Second was randomization by randomizing the respondents for the intervention group and the control group. The selection of the public health centers was also done by random drawing without the enumerators knowing. Third was making restriction by deciding exclusion criteria for the respondents. Finally, the researchers applied double blinding, an intervention process conducted by the facilitators (not the researchers), the enumerators and the research subjects who did not know whether they were in the intervention or in the control group.

Sample

The sample of this research was students of semester 5 of nursing program of study in Aceh as many as 73 people from two classes. The sample for the intervention group was 37 people and 36 people for the control group. The sample selection for both the intervention group and the control group was done by random technique. The IMCI practice was conducted for three days in public health centers by taking three IMCI cases of children aged 2 months to 5 years old. During practice, the respondents were observed of their practice per-

formance and IMCI form completing.

Paired t-test was used to compare the pretest and the posttest scores, while to check the score ratio difference of the pretest and the posttest of the intervention group and the control group unpaired t-test was used. To analyze the correlation among the research variables in the IMCI learning process both in the intervention and control group, Pearson product moment test was applied. Repeated measurement of variance statistic test was applied to examine the differences in the measurement of the IMCI practice variables in three practices.

Result

Table 1: Respondents frequency distribution based on characteristic

| No | Characteristic | Intervention Group | | Control Group | |
|----|--------------------|--------------------|------------|---------------|------------|
| | | Number | Percentage | Number | Percentage |
| 1 | Gender | | | | |
| | Male | 12 | 32.43 | 12 | 32.43 |
| | Female | 25 | 67.59 | 25 | 65.57 |
| 2 | Age | | | | |
| | 19- 20 years old | 5 | 13.51 | 4 | 10.81 |
| | >20 years old | 32 | 86.49 | 33 | 89.19 |
| 3 | Length of co study | | | | |
| | 5 semester | 37 | 100 | 36 | 97.3 |
| | > 5 semester | 0 | 0 | 1 | 2.7 |
| | Total | 37 | 100 | 31 | 100 |

Table 2: The differences of IMCI knowledge, procedural knowledge, and attitude before and after intervention in the intervention group

| Variable | Mean±SD | P | Range |
|----------------------|-----------|-------|-------|
| IMCI Knowledge | | | |
| Pre test | 47.5± 8.9 | 0.001 | 20-65 |
| Post test | 72.9± 8.5 | | 55-85 |
| Procedural Knowledge | | | |
| Pre test | 46.9±7.7 | 0.001 | 26-73 |
| Post test | 73.7±7.9 | | 53-93 |
| Attitude | | | |
| Pre test | 47.6±2.5 | 0.001 | 42-50 |
| Post test | 58.8±6.2 | | 44-55 |

Table 3: The differences of IMCI knowledge, procedural knowledge, and attitude before and after intervention in the control group

| Variable | Range | Mean±SD | P |
|----------------------|-------|------------|-------|
| IMCI Knowledge | | | |
| Pre test | 25-80 | 53.9±12.8 | 0.820 |
| Post test | 25-80 | 53.4±13.7 | |
| Procedural Knowledge | | | |
| Pre test | 20-60 | 39.2±11.2 | 0.001 |
| Post test | 6-60 | 30.65±15.7 | |
| Attitude | | | |
| Pre test | 41-53 | 46.0±2.6 | 0.920 |
| Post test | 42-55 | 47.2±3.1 | |

The Table 4 reveals that there was difference of IMCI knowledge and procedural knowledge between

The Table 1 above shows that most of the respondents were female and were more than 20 years old. Almost all of them were students of semester five.

The Table 2 illustrates that all variables of IMCI knowledge, procedural knowledge, and attitude show score difference before and after intervention with P value of 0.001.

Table 3 above reveals that in the control group, only procedural knowledge variable shows a difference between before and after the intervention with $P < 0.05$. The lowest score in the posttest was lower than in the pretest, while the highest score was the same between the pretest and the posttest.

intervention group and control group with $P < 0.05$. Meanwhile, in the attitude variable there was no dif-

ference in both intervention group and control group.

Table 5 above displays significant difference among the three times assessments of IMCI practice ($P < 0.05$). The IMCI practice score in the second practice improved 6.2 from the first practice, and then rose again as many as 3.6 in the third practice.

In the control group, there was no score difference in all IMCI first, second and third practices, with $P > 0.05$. The result analysis also did not show improvement of IMCI practice score from the first, second and third practices.

To observe the trends of the IMCI practice score improvement in the first, second and third practices, can be seen from the Figure 1 below.

Table 6 above shows a correlation between IMCI knowledge and IMCI practice in the intervention group with $P < 0.05$ after intervention.

Table 7 above reveals that there was no correlation between IMCI knowledge, procedural knowledge, attitude and IMCI management skill in the control group after intervention by IMCI practice to children aged 2 months to 5 years with $P > 0.05$.

Table 4: The differences of IMCI knowledge, procedural knowledge, and attitude between intervention and the control group

| Variable | Mean±SD | Mean Difference | 95% CI | | P |
|-----------------------------|-------------|-----------------|--------|-------|-------|
| | | | Lower | Upper | |
| IMCI Knowledge | | | | | |
| Intervention Group | 72.93±9.28 | 19.57 | 14.72 | 24.41 | 0.001 |
| Control Group | 53.37±13.70 | | | | |
| Procedural Knowledge | | | | | |
| Intervention Group | 72.46±9.50 | 41.81 | 36.41 | 47.19 | 0.001 |
| Control Group | 30.65±15.74 | | | | |
| Attitude | | | | | |
| Intervention Group | 47.43±2.21 | 0.23 | -0.87 | 1.35 | 0.495 |
| Control Group | 47.20±3.07 | | | | |

Table 5: IMCI practice differences among the members of the intervention group and the control group in first, second, and third phase

| Practice | Mean Difference | P | 95% CI | | |
|---------------------------|-----------------|---------|--------|---------|--------|
| | | | Lower | Upper | |
| Intervention Group | | | | | |
| 1 | 2 | -6.196* | 0.003 | -10.498 | -1.893 |
| | 3 | -9.804* | 0.000 | -14.618 | -4.990 |
| 2 | 1 | 6.196* | 0.003 | 1.893 | 10.498 |
| | 3 | -3.609* | 0.000 | -5.711 | -1.507 |
| 3 | 1 | 9.804* | 0.000 | 4.990 | 14.618 |
| | 2 | 3.609* | 0.000 | 1.507 | 5.711 |
| Control Group | | | | | |
| 1 | 2 | 0.087 | 1.000 | -5.661 | 5.835 |
| | 3 | -0.630 | 1.000 | -7.179 | 5.918 |
| 2 | 1 | -0.087 | 1.000 | -5.835 | 5.661 |
| | 3 | -0.717 | 1.000 | -6.654 | 5.219 |
| 3 | 1 | 0.630 | 1.000 | -5.918 | 7.179 |
| | 2 | 0.717 | 1.000 | -5.219 | 6.654 |

Table 6. The correlation of IMCI knowledge, procedural knowledge, and attitude with IMCI practice (observation 1, 2, 3) in the intervention group

| Variable | Practice 1 | | Practice 2 | | Practice 3 | |
|-----------------------|------------|------|------------|------|------------|------|
| | R | P | R | P | R | P |
| IMCI Knowledge | 0.37 | 0.01 | 0.55 | 0.00 | 0.36 | 0.01 |
| Procedural Knowledge | -0.27 | 0.07 | -0.06 | 0.71 | -0.21 | 0.15 |
| Attitude | 0.03 | 0.82 | -0.03 | 0.85 | -0.01 | 0.97 |
| IMCI Management Skill | -0.03 | 0.83 | 0.32 | 0.03 | 0.09 | 0.53 |

Table 7: The correlation of IMCI knowledge, procedural knowledge, and attitude with IMCI practice (observation 1, 2, 3) in the control group

| Variable | Practice 1 | | Practice 2 | | Practice 3 | |
|----------------------|------------|---------|------------|-------|------------|-------|
| | R | P | R | P | R | P |
| IMCI Knowledge | -0.084 | 0.577 | -0.225 | 0.132 | -0.265 | 0.075 |
| Procedural Knowledge | -0.050 | 0.7440. | -0.139 | 0.358 | -0.038 | 0.800 |
| Attitude | 0.076 | 0.614 | 0.011 | 0.944 | -0.008 | 0.958 |

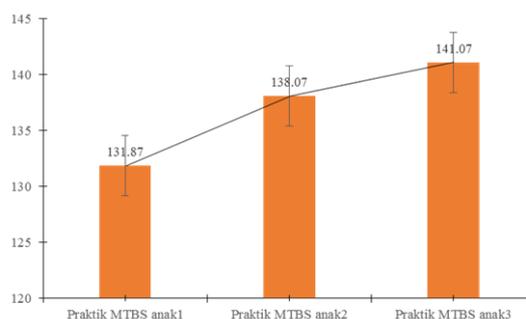


Figure 1. IMCI practice graphic

Discussion

The significant improvement of IMCI knowledge in the intervention group was most probably caused by the learning method by study guide using module, which is an active learning method. It helped students to understand the learning material better and achieve the learning objective. Learning by reading module is a catalyst in developing knowledge and competence of students [6, 7]. Learning by study guide method provides students with an experience to explore the knowledge independently without or with minimal help from a tutor. The interval of one week until the assessment of the IMCI learning result gave the students an opportunity to absorb the learned materials and to review the materials out of the class schedule [8].

Furthermore, the assessment tools that the researchers used for this research has passed the content validity test, forecast validity test and reliability test, so they are valid and can measure IMCI knowledge variables accurately and consistently. This is also in line with the opinion of Sudjana (2000) that validity relates to the accuracy of the assessment tool with the assessed concept [9]. A valid test can measure the comprehension of a specific content or material that must be mastered according to the aim of the study. In a learning process, a test that has a good content validity is the one that exactly measures the mastery of the decided learning content and materials.

The increase of the procedural knowledge after the intervention was because of the learning media used. The learning method by study guide using module helped the respondents to concentrate better during the learning process. The questions that must be answered by the end of the given material in the module caused the respondents to review several times to be able to

answer the provided questions. The students must exhibit enthusiasm, earnest, concentration, and discipline during the learning process. These aspects were exhibited during the research process.

Active learning process will develop knowledge, attitude and skills of the materials learned [10]. This method of learning generates changes in the cognitive, attitude and skill structure. Students can focus on the aspects they prefer to study, the skills they intend to develop and the existing concepts [10]. The result of the research of Tohidi, *et al.* about the effect of self-learning module on nursing student clinical competency: a pilot study on 46 students revealed a significant difference of students' clinical competency between the control group and the intervention group (Mann-Whitney U-test; $P = 0.010$) [11]. The result further showed that independent study by using module can improve the quality of the nurses' clinical competency.

In this research, the data assessment tool used was in the form of questions with multiple choice answer. Zaid and Khan (2013) said that written test in the form of multiple choice question for summative and formative can boost the learning effectiveness, preparing the (trained) students to be safe and competent in clinical practice [12]. Additionally, Zaid and Khan recommended that the MCQ test for procedural knowledge to construct questions which explore deep understanding or basic knowledge content with higher order thinking skills in short questions requiring problem solving and clinical skills.

The attitude variable indicated that there was no difference in attitude towards IMCI before and after treatment with $P > 0.05$. It showed that the respondents in the intervention and control group had improvement of attitude score after IMCI learning. This was probably because they had learned IMCI materials from

other courses, so the respondents had positive perception. Attitude is an emotional reaction concerning experience coming from cognition, thinking, and action [13]. In this learning, the attitude is formed based on the acquired experience. If students are actively involved in the learning process, then the attitude formed will be more positive [6, 13]. This process generates intellectual involvement, social emotion, body and mind entirely during the learning process which will lead to positive attitudes in accordance with the gained experience [6]. The shaping of attitude includes values, belief that happens when the students face the challenge to think deeply and critically towards something or their guidelines in doing something when it relates to other people or their wishes. In the learning process by study guide method students must focus to study independently so they will be challenged to think critically and discover what they are learning so they will understand the content of the module used.

IMCI application is the last step in this research process which was intended to analyze how the IMCI learning by study guide method has efficacy towards IMCI practice skills of the students. The IMCI practice was executed to assess the competency of performing IMCI management to children of 2 months to 5 years old. The practice which is based on knowledge will give a different result compared to practice based on habits. The IMCI practice is a must for students, in order to prepare them as future nurses to be able to perform the required tasks when they treat child patients in real situation [14]. In executing IMCI practice, the students must have the competency which corresponds to the core competency established by the WHO. The WHO also recommended that 44.2% of IMCI training period be allocated for clinical practice [15].

IMCI learning in the pre service stage must be done in class and in clinic. The learning process in classroom is the shaping of cognitive, attitude and skill ability at the academic level, while practice in clinic is done to implement the ability obtained at the academic scope in the reality. This process is to enhance the skill in performing management of childhood illness according to the situation and case in the practice site. The learning by doing process in IMCI clinical practice will enhance students' skill in executing IMCI, so they will eventually become competent in that aspect [16]. The result of the research of Fujimori, et al. (2010) titled Integrated Management of Childhood Illness (IMCI) knowledge and practice of nurses who have graduated from school of nursing at University of Sao Paulo-a case study revealed that all the participants still remembered the IMCI strategy learned and applied it during work [17]. However, more than one third of them were not confident in applying it due to the lack of theory content and so they suggested the need of revision in the IMCI learning methodology.

Another research using a hypothetic model to predict nursing students' perception about the application of pre service IMCI training in Oman (2016) resulted in that all students of nursing who received IMCI training gained the benefit and planned to implement it [18].

Conclusion

The scores of IMCI knowledge, procedural knowledge, and attitude were higher after IMCI learning by the method of study guide using module. The IMCI knowledge, procedural knowledge, attitude and practice scores were higher in IMCI learning by the method of study guide using module compared to IMCI learning by conventional method using IMCI chart. The higher the IMCI knowledge score, then the higher the IMCI practice score.

According to the research result, it is necessary to make a plan of IMCI material which has been integrated into other existing courses, to provide accurate media and learning process, and trained facilitators to organize the IMCI learning. In addition, there needs to be an arrangement of Standard Operating Procedure on the execution of IMCI learning that is integrated into a relevant course. A support from lecturers for IMCI learning to be executed by the method of study guide using module integrated into the education curriculum of associated degree in nursing study program in Aceh is much needed.

The existing case related to IMCI is one of the ways to fulfill the need for practice so the learning competency can be achieved. In the future, there needs to be a research on the IMCI learning process with case approach happening in the area. The research should consider repeated measurements on knowledge, procedural knowledge and attitude aspects periodically after IMCI learning process. This is to check the resistance level as the illustration of the effectiveness of the conducted learning method.

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