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Virtual Reality Improves The Knowledge of Midwives in IUD (Intra Uterine Device) Training

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Abstract

IUD family planning users continue to decline from the 2012 IDHS as much as 4.9%, in 2017 IDHS data of 3.9%. The Total Fertility Rate (TFR) in NTB Province was 2.8 children higher than the national target of 2.36 children. This study aims to analyze the application of virtual reality technology to increase midwives' knowledge in installing IUD. The design of this research design is a quasi-experiment with a pre-post non-equivalent control group design. This research design uses two groups: the case group (the group that is given treatment or intervention using virtual reality) and the control group (the group that is not given treatment or not using virtual reality). The number of samples in this study was 30 respondents for each group (treatment and control). The results of this study that the average knowledge after the intervention group training has a higher average than the average in the control group with a p-value (0.000) <α (0.05).

Keywords: Virtual Reality;Knowledge;IUD;Training

INTRODUCTION

Indonesia is the 4th country in the world, with an estimated population of 269 million. Among ASEAN countries, Indonesia, with the most significant region, remains the country with the largest population, far above the other nine member countries. With the Fertility Rate or Total Fertility Rate (TFR) of 2.6. Indonesia is still above the average TFR of the ASEAN countries, namely 2.4. (Indonesian Ministry of Health, 2017)

The data and information center of the Indonesian Ministry of Health estimates the total population of Indonesia in 2017 to be 264 million. The 2017 IDHS data shows a total fertility rate (Total Fertility Rate or TFR) of 2.4 children per woman, which means a woman in Indonesia is on average deliver an average of 2.4 children during her lifetime current ASFR pattern. The total fertility rate in rural areas (2.6 children) is 13 percent higher than in urban areas (2.3 children). Of the various contraceptive methods based on data, the contraceptive contraceptive contraceptive method (29%) is the most widely used contraceptive method for married women, followed by pills (12%), implants and IUD (5% each), and tubectomy (4%). Together with vasectomy, implant, IUD, and tubectomy are long-term contraceptive methods which are recommended for use in the Birth Plan Program. Thus, 14 percent of women use long-term birth planning. Many kinds

of long-term contraceptive methods are recommended, one of which is the IUD. However, based on data from the National Medium-Term Development Plan of currently married women aged 15-49 years, IUD family planning users continue to decline from the 2012 IDHS as much as 4.9%, in the 2017 IDHS data of 3.9%. (Indonesian Ministry of Health, 2018)

Total Fertility Rate (TFR) in West Nusa tenggara was 2.8 children, higher than the national target of 2.36 children. In West Lombok District, from data on the use of contraceptives by active and new family planning participants, the most used was injectable family planning (52.88% active family planning and 61.9% new family planning) and the lowest reported coverage of the use of contraception was tubektomy (0.01%). Referring to the criteria for selecting the area for the formation of birth plan village, West Lombok Regency was selected because from the data, the coverage of active long-term contraception participants was relatively low, such as in the Labuapi District, West Lombok Regency, the coverage of long-term contraception was low according to data from a total of 148 women, only 9 long-term contraception users. 1% with details of IUD : 6 Acceptors tubektomy: 1 Acceptor and Implant: 3 Acceptors. (Indonesia Health Profile , 2016)

The program to strengthen personnel capacity for family planning services is carried out with various kinds of training. One of them is the CTU (Contraceptive Update) program for midwives. In this training, health workers, especially midwives, are given the training to provide contraceptive services in the form of implants and IUD. However, this training is still conventional, namely by the method of question and answer lectures, demonstrations, and practicum which require time and professional staff.

VR technology in schools and other education fields is expected to motivate student learning and improve learning experiences. This hope is supported by the exploration of Samsung Electronics Germany through a survey. According to a survey conducted by the German research firm EMNID's Office, of 606 school teachers across Germany, 92% support the use of digital technology in the classroom. The survey results also show great interest in the use of VR as an educational medium (Mekacher, 2019)

In Indonesia, VR technology for education is still relatively small. However, its existence is getting more and more familiar with several startups targeting VR. The average person can only remember 20% of the information heard, while 30% remembers what he saw. Nearly 90% of people can remember information based on what they have experienced, for example, by direct practice. However, not everyone has the opportunity to experience many things firsthand, such as IUD insertion training, which is currently being carried out by conventional learning, namely practicum on phantoms. (Pratiwi, Husin, Ganiem, Susiarno, & Arifin, 2017)

Research on virtual reality used in instructional media has been researched by Ramdhan, 2017 which is applied to elementary school students. The results of this study can be concluded that the VR-based Learning Video is feasible to use because it has a good impact on students' understanding of the learning material. The score obtained is 1664, or 73% of the total score of 2250. A score of 1664 is in the feasible category for use because it provides benefits. and increase student knowledge (Rachman, 2017)

Teresia et al., 2014 also examined the perception of the effectiveness of teaching VR media. In this study, the use of VR media in

teaching supports material that is a prerequisite for visualization, practice, and limited resources. The desire of the respondents tends to be very high (53.8%) for the use of VR technology in learning. However, in this study, the suggestions given for further research are the need for a specific mechanism to design VR with certain topics and implement it (the effectiveness of VR media) (Sunarni & Budiarto, 2014).

Hooper et al., 2019 examined the use of VR in a simulation of medical faculty resident students to perform arthroplasty operations. By using 14 samples of orthopedic students, the results of this study's VR simulation improved the surgical skills of the residents. (Hooper et al., 2019)

The implementation of VR in medicine has often been done, but there has not been a single study that has implemented VR in midwifery training. This study is the first to apply VR in the context of IUD insertion. Based on the above background, research is needed "Application of Virtual Reality Technology to Increase Knowledge of Midwives in IUD Installation."

METHOD

This research was conducted with permission from the ethics committee of the Poltekkes of the Mataram Ministry of Health number LB.01.03 / 1.1 / 4597/2019. This research was conducted at Narmada Health Center from 22 July to 14 August 2020. This study's sample was 60 midwives taken from 21 health center in West Nusa Tenggara, divided into two groups. Thirty intervention groups and 30 control groups.

In the intervention group, they were given training in installing the IUD using VR. The duration of the video in VR on one person is 11 minutes. The control group was given regular conventional training. The training for both groups began with material from obstetricians, material from CTU trainers. The variable measured in this study was the knowledge of midwives before and after training. The knowledge of midwives is measured by standard questions given to the CTU training with 50 questions, with 0 if it is false and two if it is true. The total final score is 0 to 100. This question has been tested for its validity and reality before.Other variables measured by the questionnaire are age and length of work. The analysis used in this study was the independent two-sample t-test.

RESULTS AND DISCUSSION

Table 1. Characteristics of Respondents

Characteristics	VR	Control	p-value
Age	32,33 ± 6,04[a]	31,87 ± 4,65	0,74
Experience	10,14 ± 6,59	9,13 ± 5,23	0,87
Situational factors	75,07 ± 6,04	70,43 ± 6,72	<0,01

Table 1 shows that the average age of midwives in the intervention group was older than the average age of midwives in the control group. However, the p value is 0.74> 0.05. So the conclusion is that there is no difference in the mean age of the intervention group and the control group.

When viewed from the average age value of the intervention group, it is almost the same as the control group, namely 32.33 years and 31.87 years, respectively, so that the two groups are homogeneous in terms of age.

Younger workers tend to experience more helplessness when compared to older workers. This thing can occur because younger workers tend to have low work experience when compared to older workers, or it is caused by other factors such as older workers who are more stable, more mature, have a more balanced view of life, so they are not prone to mental stress. or helplessness at work (Widodo, 2014)

Hasanah and Widowati (2011) suggest the influence of labor age on labor productivity. Young age reflects a muscular physique to work fast so that the resulting output also increases, and vice versa. Age dramatically affects the physical abilities of workers. Young age, large production. Productivity decreases in old age. Workers of productive age (15-60 years) have a positive relationship with labor productivity. This means that if the workforce's age is in the productive category, their work productivity will increase. This is because workers have high creativity towards work at the level of productive age. After all, it supports better knowledge and insight and has a high responsibility for the assigned task. (Ukkas, 2017).

Table 3.1 shows that the p-value is 0.87> 0.05, so the conclusion is that there is no difference in the average length of working in the intervention group and the control group. If seen, the average value of the length of work in the intervention group is almost the same as the average value of the control group, namely 10.14 years and 10.45 years, respectively.

A person's work experience shows the types of work a person has done and provides an excellent opportunity for someone to do a better job. Experience is a process of learning and development of potential behavior both from formal and non-formal education. It can be interpreted as a process that leads a person to a higher behavior pattern. (Widodo, 2014)

Work experience is reflected in workers who have the ability to work in other places before. The more experience a worker gets, the more trained and skilled workers will be in carrying out their work. The presence of workers who have work experience is expected to get a job according to their expertise. The longer a person is in a job that is in accordance with their expertise, it is expected that they will be able to increase their productivity. So it can be said that work experience has a positive influence on labor productivity.

Hasanah and Widowati (2011) found a significant influence between work experience and labor productivity levels. Work experience makes workers more diligent, painstaking, and qualified. This also relates to job training and skills in using work tools. The longer a worker does his job, the more skilled he will be. High skills will have a positive impact on their performance, such as the time needed to complete their work faster. Besides that, the quality of their work will also be better. Work experience influences the amount of production and the size of the efficiency, which can be seen from the results of directed labor production. In another sense, work experience can also be gained by going through the years of work that has been done in a workplace. A person's work experience in a job which is manifested in the number of years of work, will increase one's work

abilities and skills so that the work results will increase. (Ukkas, 2017)

The age of a midwife also influences the improvement of midwives' skills in installing the IUD. Older age is also associated with the factor that the midwife has more clinical experience in the field of providing midwifery services. This, of course, will affect the skill aspect. The more often do it, the more skilled. The older the age and the longer a midwife works in the service, it should be balanced with better skills and competencies in providing services both at the Health center and the hospital. If seen, the average value of the length of work in the intervention group is almost the same as the average value of the control group, namely 10.14 years and 10.45 years, respectively.

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Table 2 Respondents Education Level

Education	VR	Control	p-value
Diploma	29	27	1,00
Bachelor	1	3	

Table 2 shows that the level of education in the two study groups was not significantly different (p> 0.05). Thus the two groups were equal. With these results, the two groups are considered to be homogeneous in education level.

Table 2 shows that the level of education in the two study groups was not significantly different (p> 0.05). Thus the two groups were equal. With these results, the two groups were considered to be homogeneous in their education levels. In the control group, the number of midwives graduated from the bachelor's. However, this had no effect on the skills of the control group. The diploma level according to Indonesia curriculum is at level five with the level of mastery of knowledge: mastering theoretical concepts in the field of knowledge and skills in general, while the education level of bachelor is at level 6 Indonesian Curicullum, namely: mastering theoretical concepts in certain areas of knowledge and skills in general and theoretical concepts in special sections these in-depth. (Directorate of Learning and Student Affairs, 2020)

In this study, the level of education did not affect the knowledge or skills of a midwife in providing family planning services, and the researcher argues that many other factors influence knowledge that is more dominant than the level of education of a midwife, namely clinical experience gained from long working in services.

Table 3. Respondents Knowledge Level

Knowledge Level	Group		p-value
	VR	Control	
Pre :			
Mean	55,93	48,27	<0,01
St Dev	15,77	6,03	
SE Mean	2,88	1,10	
Post			
Mean	84,93	73,27	
St Dev	7,57	7,87	
SE Mean	1,38	1,44	

Table 3.3 shows that when viewed from the mean value, the average after training (84.93) has a greater average than before training (55.93). From this it can be concluded that training has a significant effect on the intervention group in terms of increasing knowledge. Likewise in the control group the mean after training (73.27) had a greater mean than before training (48.27). From this it can be concluded that training had a significant effect on the control group in terms of increasing

knowledge of midwives. Because the p-value (0.000) <α (0.05), the conclusion is reject H0. This means that there is a difference in the average before and after training in both the intervention group and the control group.

The knowledge score of the two groups before being given the intervention had previous differences, but the two groups remained in the same range, namely below 60. The mean score of the intervention group was 55.93 and the control group was 48.27. This shows that the knowledge about family planning in the two study groups was the same at the beginning before being given training. The two research groups before being given the training did not meet the requirements and were equally bad, namely less than 60. However, after the training the average VR group met the pass requirements, namely> 78 with an average value of 84.93 and control 73.27.

The use of dynamic VR experiences leads participants to discover them for themselves, which encourages them to learn through curiosity and exploration. (Pareek, Mehta, Geraldine Bessie Amali, & Gupta, 2018) Educators use VR to calm and refocus students experiencing sensory overload. This technology is being used to create personalized learning environments for participants with special needs. With 3D modeling and VR creation, participants have the tools to express their understanding, create solutions, tell stories or create works of art. (Dyer, Swartzlander, & Gugliucci, 2018)

In the current era, trainees are more comfortable learning from various electronic components such as through YouTube and various e-learning. Virtual Reality is very useful for professional training, because VR allows people from various professions to prepare for their roles in the expected environment. Zlateva, 2017)

Virtual Reality is not only interesting in the era of the industrial revolution 4.0 but is able to improve the quality of a competency and be able to increase empathy. (Dyer et al., 2018; Raghavan & Rao, 2018). The use of VR for education is very appropriate to make lessons come alive, and this is something that deserves to be a priority in the world of education today, especially for training in order to achieve the goal of improving the health status of the Indonesian people.

Research on virtual reality used in instructional media has been researched by Ramdhan, 2017 which is applied to elementary school students. The results of this study can be concluded that the VR-based Learning Video is feasible to use, because it has a good impact on students' understanding of the learning material. The score obtained is 1664 or 73% of the total score of 2250, a score of 1664 is in the feasible category for use because it provides benefits. and increase student knowledge (Rachman, Information, Information, Informatics, & Information, 2017)

In classroom learning, the most widely used teaching method is lecturing. This learning method is the best method (ranked. In lecturing, the learning media used can be people, objects, text, audio, visuals, videos, multimedia computers and internet-based media. Virtual Reality (VR) technology is an extension of technology. multimedia computers. (Bossard, Kermarrec, Buche, & Tisseau, 2008; Devon & ClassVR, nd; Martín-Gutiérrez, Mora, Añorbe-Díaz, & González-Marrero, 2017)

VR has advantages over previous learning media. “Low Cost VR” and Desktop VR are mature

technologies that have the potential to be used in learning. (Okechukwu & Udoka, 2011)

To achieve the desired competencies in learning in higher education, many media and learning methods can be used. The use of learning media is absolutely necessary. The use of instructional media can be done by following the instructor / lecturer presentation learning pattern for student groups, individual learning, or interactions between instructors / lecturers and students. For individual learning patterns, one of the learning methods is independent learning. In independent learning, student success is strongly influenced by the learning style (type) of students. According to Kolb, there are four types of learners, namely convergers, divergers, accomodators and assimilators. Of the various student learning styles, the most successful media accommodate this type of learning

CONCLUSION

The result of this study is that there is a difference between the knowledge of midwives in the group using VR and not using VR. The limitation in this study is the VR video content that does not yet describe the IUD insertion with good visuals. The use of VR depends on the degree of technological literacy of each VR user, so in the next research, the researcher suggests to carry out deeper habituation in the introduction of VR so that users can use VR more before measuring the level of knowledge. The results of this study can be used to recommend IUD family planning training during the pandemic. Acknowledgment for Health Research Agency of Indonesa and Festivo. This research is funding by health research agency, Health Ministry of Indonesia.

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