The Effect of Audio Visual Aids On The Level of Knowledge of Hemodialysis Patients

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ABSTRACT
Hemodialysis has a therapeutic effect on patients with chronic renal failure. However, on the other hand, it can also cause acute complications that can negatively affect the quality of life. Acute complications can be prevented by changing the lifestyle of hemodialysis patients, one of which is by using audio-visual aids. This study aims to determine the effect of audio-visual aids on the patient’s level of knowledge about dealing with acute complications of hemodialysis. This study used a quasi-experimental design with pre and post-tests without a control group with 30 hemodialysis patients who met the inclusion criteria as respondents. This study indicates a significant effect between the use of audio-visual aids and the level of knowledge related to the management of acute complications in hemodialysis patients (p-value= 0.000). Therefore, nurses can use audio-visual aids as a means of education to deal with acute complications of hemodialysis.

INTRODUCTION
Chronic renal failure is a progressive and irreversible decline in kidney function. The body cannot maintain metabolic, fluid, and electrolyte homeostasis, resulting in a buildup of urea. Terminal renal failure is often used in end-stage renal failure with a glomerular filtration rate of 15 mL/min/1.73 m2 with signs and symptoms of uremia requiring renal replacement therapy to reduce the risk of mortality and morbidity (Daugirdas, Blake, & Ing, 2015). Globally, in 2017, 1·2 million people died from CKD. The global mortality rate for CKD of all ages increased by 41.5% between 1990 and 2017. In 2017, there were 697,5 million cases of CKD of all stages with a global prevalence of 9.1%. The global prevalence of CKD at all ages has increased by 29.3% since 1990. CKD earned 35.8 million Disability Adjusted Life-Years (DALYs) in 2017, with a third of DALYs is diabetic nephropathy. 1.4 million cardiovascular disease-related deaths and 25.3 million DALY cardiovascular disease are attributable to the disorder kidney function (Global Burden Disease Chronic Kidney Disease Collaboration, 2020).

The number of patients with kidney disorders in developed countries is relatively high. For example, the prevalence of chronic renal failure (stage 1-5) in the United States was 14.8% in 2011-2014. In 2015, more than 660,000 people with kidney failure in America, 468,000 were on dialysis, and more than 193,000 had kidney transplants (United States Renal Data System, 2016). This number increased at the end of 2018 to 554,038 (70.7%) patients undergoing dialysis and patients with functioning kidney transplants totaled 229,887 (29.3%) (United States Renal Data System, 2020). The number of ESRD patients who started hemodialysis for four consecutive years in 2018 ranged from 111,000 to 113,000. Meanwhile, the number of patients who started peritoneal dialysis and who received transplants reached an all-time high of 18,631. In 2018, the number of ESRD patients increased by 2.3% since 2017 to 131,636 (United States Renal Data System, 2020).

In Indonesia, the prevalence of chronic renal failure in 2013 was 0.2%, and only 60% undergo hemodialysis. The province with the highest prevalence of CKD is Central Sulawesi at 0.5%, followed by Gorontalo, Aceh, and North Sulawesi at 0.4% each. Meanwhile, in DKI Jakarta province, the prevalence of chronic kidney failure is 0.1% (Riskesdas, 2013). In 2018, the prevalence of chronic renal failure increase to 0.38%. The province with the highest prevalence of CKD is North Kalimantan (0.64%) (Riskesdas, 2018).

Medical management for end-stage chronic renal failure is hemodialysis, peritoneal dialysis, and kidney transplantation. Hemodialysis can remove toxic nitrogen and excess water from the blood, restore acid-base balance, fluids, and electrolytes (Black & Hawks, 2014). More than 2 million people worldwide are currently receiving dialysis therapy or kidney transplantation to stay alive (Jha et al., 2013). The United States Renal Data System (2016) showed an increase in hemodialysis patients from 2012-2013 to 352 hemodialysis patients.
from the Indonesian Renal Registry (IRR) (2014) shows that the number of hemodialysis patients in Indonesia in 2014 shows that the number of patients increases every year. The increase in hemodialysis patients from 2013-2014 reached 13.6% of new patients and 24.4% of active patients. In 2017, there were 77,892 active patients undergoing hemodialysis and new patients 30,831 patients. This number increased in 2018 to 132,142 active patients undergoing hemodialysis and new patients 66,433 patients (IRR, 2018).

In addition to the therapeutic effect, hemodialysis can also cause complications for patients, where these complications can reduce the patient's quality of life. Acute complications often occur during hemodialysis, including decreased blood pressure (hypotension), increased blood pressure (hypertension), nausea and vomiting, muscle cramps, back pain, headache, chest pain, disequilibrium syndrome, itching, fever, and chills—hemolysis, hemorrhage, air embolism, hypoglycemia, hypokalemia, dysrhythmias, and cardiac arrest. Chronic complications are complications that occur in patients with chronic hemodialysis, including hyperlipidemia, atherosclerosis, ischemic heart disease, malnutrition, hypertension/fluid volume excess, anemia, neuropathy, infection (hepatitis, HIV), complications in access, bleeding disorders, and others (Mandal, 2014; Daugirdas, Blake, & Ing, 2015).

A field study conducted at the hemodialysis unit in Central Jakarta in March 2018 showed there were ±150 hemodialysis patients, 75% experienced acute complications on hemodialysis. The results of further field studies obtained acute complications often experience by hemodialysis patients were nausea (50%), vomiting (22.31%), muscle cramps (37.69%), pruritus (52.31%), fatigue (75.38%), cannulation pain (43.85%), thirst (76.15%), and insomnia (43.08%). If not treated immediately, these acute complications can negatively affect the quality of life of hemodialysis patients.

Quality of life is an essential benchmark for patients after undergoing dialysis therapy. According to Ferrans and Powers (1994), quality of life is a well-being that is felt by a person and comes from satisfaction/dissatisfaction with areas of life that are important to them. After undergoing dialysis, the patient's quality of life has decreased because the patient has to face health problems related to CKD and lifelong dialysis therapy so that the patient must be able to adapt throughout his life. Chronic kidney disease can affect the patient's quality of life in several ways. When a patient is diagnosed with CKD by a doctor, the patient experiences fear, anxiety and depression. Symptoms experienced by patients such as fluid retention, bone pain, peripheral neuropathy, or sleep disturbances as a side effect of medication or dialysis therapy can also negatively affect the patient's well-being and affect the patient's role and daily activities. Activity restriction, diet and fluids, and the inability to travel long distances also affect the patient's quality of life (Arici, 2014).

Based on the interviews conducted by researchers with four respondents, data obtained from the four respondents did not know about acute complications that often occur in hemodialysis patients and how to handle them independently. Respondents said that several nurses had given health education regarding the symptoms often experienced by hemodialysis patients, but it was not structured. Education is carried out when the nurse performs the installation or removal of the device for hemodialysis and also when the nurse monitors the patient's condition during hemodialysis. However, there has not been a scheduled education in the room for patients who routinely undergo hemodialysis.

Educational intervention has been used in hemodialysis patient for various goals. A systematic review conducted by Mason et al. (2008) about educational intervention in kidney care found various educational interventions with variable goals and outcomes. Eighteen studies provided significant results for at least one of the outcomes of psychological, clinical, knowledge and behavioral. It showed that the education intervention were success to completed the goal.

Educational intervention can be carried out by a competent nurse. Education can be done face-to-face, or video (Sari, 2021). Video is included in electronic audio-visual media because it involves the sense of hearing and the sense of sight. This audio-visual media can produce better learning outcomes for tasks such as remembering, recognizing, recalling, and connecting facts and concepts (Rahmatawi, Toto, Parasmatri, 2007). Video as an educational media can accurately describe a process, be watched if needed, and encourage and increase respondents' motivation. Videos containing positive values can invite thoughts and discussions in the respondent group and present information to the group, large or small groups, heterogeneous groups, or individuals (Sadiman et al., 2005).

Abed, Himmel, Vormfelde & Koschack (2014) conducted a systematic review related to the means of educating patients in changing their lifestyle by using the video method. To present information: didactic presentations (objective information given as verbal instructions with or without numbers), practical presentations (real people are filmed while engaging in certain practices), narrative presentations (real people are filmed while creating scenes). Seven out of ten studies reporting behavior change adopted a practice presentation or narrative presentation format. This systematic review concludes that videos that demonstrate direct interventions are more effective than videos that provide oral or graphic health information. However, some of
these problems usually lead to a decrease in quality of life. Based on this, a study was compiled that emphasizes interventions to overcome the symptoms of HD patients in the form of videos.

**METHODS**

This study used a quasi-experimental design to determine the effect of audio-visual aids on the level of knowledge of hemodialysis patients. This study used a purposive sampling method with inclusion criteria; outpatients undergoing hemodialysis for at least six months, communicating verbally in Indonesian, willing to be a respondent. The number of respondents was 30 respondents. This study was conducted in April-May 2018 in a hemodialysis unit in central Jakarta, Indonesia.

The educational video was made based on previous field studies, which explained how to deal with acute complications of hemodialysis. After the educational video was made, the researchers selected respondents who would participate in an innovation project in Audio-Visual Aids (AVA). Based on the inclusion criteria, 30 clients who met the criteria were obtained. Before the video was shown, a pre-test was conducted on 30 respondents. For one week, educational videos were played in HD 1 and HD 2 rooms on the morning shift using a television screen. Video playback was also carried out using mobile phones for 30 respondents who participated in this innovation. Evaluation in the form of a post-test was carried out a week later to determine if there was an increase in the client's knowledge regarding hemodialysis and how to deal with acute complications of hemodialysis. After the evaluation, the educational video was sent to the telephone number of each respondent via the WhatsApp application.

**RESULTS AND DISCUSSIONS**

The characteristics of respondents in this innovation activity are described in tables 1 and 2. The results of the analysis in table 1 show the number of respondents who are male, 23 people (76.7%), high school education level 24 people (80%), working as many as 16 people (53.3%). Table 2 shows that the average age of the respondents is 52.07 years, with a minimum age of 29 years and a maximum age of 76 years. The average length of HD in this innovation respondent is 51.03 months, with the shortest time being 11 months and the longest being 180 months.

Table 3 shows the average educational score for patients undergoing HD before intervention was 54.25 with a standard deviation of 12.60 and a minimum score of 26.67, and a maximum score of 73.33. After the educational intervention, the average educational score obtained by respondents increased by 34.06 points to 88.31 with a standard deviation of 10.18 and a minimum score of 66.67, and a maximum score of 100. Further analysis showed that the p-value was smaller than 0.05, indicating an effect of education on related knowledge management of acute complications in hemodialysis patients.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>Male</td>
<td>23</td>
<td>76.7</td>
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<tr>
<td>Total</td>
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<tr>
<td>Education</td>
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<td></td>
</tr>
<tr>
<td>Junior high school</td>
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<td>6.7</td>
</tr>
<tr>
<td>Senior high school</td>
<td>24</td>
<td>80</td>
</tr>
<tr>
<td>University</td>
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<td>13.3</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
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</tr>
<tr>
<td>Employment</td>
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<td>Not employed</td>
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<td>46.57</td>
</tr>
<tr>
<td>Employed</td>
<td>16</td>
<td>53.3</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2. Distribution of Respondents by Age, Length of HD

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>SD</th>
<th>Minimal - Maximal</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>52.07</td>
<td>53.5</td>
<td>11.25</td>
<td>29-76</td>
<td>47.83-56.23</td>
</tr>
<tr>
<td>Length of HD(month)</td>
<td>51.03</td>
<td>36</td>
<td>40.30</td>
<td>11-180</td>
<td>35.98-66.08</td>
</tr>
</tbody>
</table>
In this study, the results showed a significant relationship between educational interventions using video and increasing knowledge of hemodialysis patients about the acute complications they experienced. Abed et al. (2014) also said that using video as a medium of education can effectively increase respondents’ knowledge. The results of this study are also in line with Kapti’s research (2010) regarding the effect of health education with audiovisual media (video) on mothers’ knowledge and attitudes about diarrhea in children. Based on this study, audiovisual media used were able to increase mothers’ knowledge and attitudes about diarrhea management in children. Likewise, Ulfa (2013) research regarding the use of educational media in videos has also been shown to increase student’s knowledge about dental health. Finally, the results of Maslampak & Shams (2015) research show a significant relationship between educational interventions using video and improving the quality of life of hemodialysis patients.

One of the nurse's roles is as an educator in charge of providing health education to patients to achieve better health status. Health education is applying the concept of education in the health sector to gain knowledge about better health (Notoatmodjo, 2011). Health education can be done using health education media to make it easier for respondents to receive the intended health message. These media are grouped into print media, as well as electronic media. Changes in patient behavior in a positive direction can reduce mortality by increasing patient knowledge (Curtin, Sitter, Schatell & Chewning, 2004).

Several research showed that education using Audio Visual Aids (AVA) like video as effective as education using face to face or infographic (Moonaghi et al, 2012; Ebrahimabadi, 2018). Research conducted by Moonaghi et al (2012) found that there was not significantly different between the effectiveness of face to face and video-based education on patient adherence on diet and diet fluid. Regarding the increase number in hemodialysis patients, time consumption, and difficulties of face-to-face training, it is recommended that more attention be paid to paid for video-based education. Study conducted by Ebrahimabadi et al (2018) in asthmatic patient also showed that both video formats and infographic may increase adherence to treatment protocols. However it seems that the infographic format is preferred for long term use as it does not require the use of facilities.

According to the researcher’s observations, the hemodialysis nurse has conducted education regarding the complaints experienced by patients orally to patients who ask questions. The education tends to be a notification without giving a direct example and is more directed to pharmacological therapy. Therefore, the Audio-Visual Aids (AVA) about handling acute complications of hemodialysis patients will optimize room nurses’ role in providing education to patients. In addition, the patient will feel satisfied because the educational material is following the complaints felt by the patient with material that has been scientifically proven. Audio-Visual Aids (AVA) is beneficial for patients in obtaining information and increasing knowledge about how to deal with acute complications of HD. The advantages of educational videos are that they can store videos in their communication tools, easy to use, and cost-effective (Maslampak & Shams, 2015).

**CONCLUSIONS**

There is a significant effect between audio-visual aids and the level of knowledge related to the management of acute complications in hemodialysis patients. The advantage of Audio-Visual Aids (AVA) is that patients can repeat educational materials by listening to videos wherever and whenever the patient wishes, this educational video explains not only the management of acute complications in HD patients but also discusses kidney-related in general and hemodialysis, the management provided is in the form of non-pharmacological treatment. The patient himself can do this without special skills and tools. For nurses, this educational video saves nurses time because patients can watch the videos themselves, but they can be asked to nurses if there are questions. The disadvantage of implementing this education is that patients must have a smartphone that can access videos. The obstacle experienced by researchers is the limited time for implementing education, so that they have not been able to carry out a comprehensive evaluation. Therefore, there is a need for collaboration with room nurses and the nursing department for continuous education. This education needs to be done to patients who have just undergone hemodialysis and patients who have been on hemodialysis for a long time with a frequency of 1 month 2 times and patients with end-stage renal failure as a means to determine the choice of kidney replacement therapy.

![](10.47028/j.risenologi.2021.61a.216)
REFERENCES


