

# APPLICATION OF A COMBINATION OF ANKLE PUMP EXERCISE AND CONTRAST BATH TO THE REDUCTION OF EDEMA DIAMETER IN PATIENTS WITH CRONIC KIDNEY DISEASE THROUGH THE VIRGINIA HENDERSON THEORY APPROACH IN THE NON-TRAUMA EMERGENCY DEPARTMENT OF RSUP. PROF. DR. R.D. KANDOU MANADO

Joice Mermey Laoh<sup>1</sup>, Herman Warouw<sup>2</sup>, Jon Tangka<sup>3</sup>, Rolly Rondonuwu<sup>4</sup>, Samuel Tambuwun<sup>5</sup>, Maykel Kiling<sup>6</sup>, Yurike P. Mandolang<sup>7</sup>, and Yanni Karundeng<sup>8</sup>

<sup>1,2,3,4,5,6,7,8</sup>Politeknik Kesehatan Kementerian Kesehatan Manado.  
jola17gadar@gmail.com

**Abstract.** Chronic Kidney Disease (CKD) patients often experience various problems, one of which is lower limb edema. The application of Ankle Pump Exercise can provide a pumping effect and hydrostatic Contrast Bath which can significantly reduce lower limb edema. have lower limb edema. Objective: Applying the combination of Ankle Pump Exercise and Contrast Bath with the Virginia Henderson Theory approach Method: This research is descriptive research with a case study approach. The data obtained were primary data and secondary data. Data collection methods using observation sheets. The research was conducted in the Non Trauma Emergency Room at Prof. Dr. R. D. Kandou Hospital Manado for four days. It was determined that 4 samples had oedema in the lower extremities and as the focus of the case managed to be given the same implementation according to the inclusion and exclusion criteria. Results: Four clients experienced hypervolemia nursing problems, then implementation was carried out based on Evidence Based Nursing. After being given a combination of Ankle Pump Exercise and Contrast Bath to clients, the degree of edema decreased from degree four to degree three and degree three to degree two. Conclusion: The use of the Virginia Henderson assessment model can be used to fulfil patient independence in lower limb oedema problems. The application of Evidence Based Nursing Combination of Ankle Pump Exercise and Contrast Bath can effectively reduce edema in CKD patients in the Non Trauma Emergency Room at Prof. Dr. R.D Kandou Manado.

**Keywords:** Chronic Kidney Disease (CKD), Edema, Ankle Pump Exercise, Contrast Bath.

## 1 INTRODUCTION

Chronic Kidney Disease has emerged as one of the leading causes of death in the 21<sup>st</sup> century. Due to increasing risk factors for kidney disease such as obesity and diabetes mellitus, the number of people with chronic kidney disease is also increasing, affecting an estimated 843.6 million people worldwide in 2017 (Jager et al., 2019). According to data (WHO, 2020), deaths from Chronic Kidney Disease in the world experienced a significant jump from rank 13 to rank 10 with the number of deaths from 813,000 in 2000 to 1.3 million (WHO, 2023).

In North Sulawesi, the prevalence of kidney failure above 15 years of age is 0.52% and ranks third after North Kalimantan and North Maluku (Ministry of Health Indonesia, 2018). Patients with Chronic Kidney Disease need to get guidance and direction regarding fluid restriction, if there is an increase in the amount of fluid with a significant increase in body weight, they can experience an increase in urea levels, difficulty breathing, edema, edema in the extremities where edema is one of the symptoms that

often appear in patients with Chronic Kidney Disease (CKD) and the most severe is resulting in death (Suparmo et al, 2021; Lestari et al., 2022; Gorelik et al, 2021).

The application of the combination of Ankle Pump Exercise and Contrast Bath still sounds unfamiliar to be applied in hospitals, but it can be effective in preventing bad things from happening to. However, it can be effective in preventing bad things from happening to people with Chronic Kidney Disease, the application of this action is also very effective from the perspective of the need for funds and labour is not large enough to carry out this intervention, it is also easy to implement independently by clients.

This is in line with Virginia Henderson's theory which defines the theory of needs which suggests that nurses must care for patients, but at the same time help patients gain independence so that once discharged, they can take care of themselves, where the application of the combination of Ankle Pump Exercise and Contrast Bath can be done effectively, independently when the patient is discharged from the hospital, and through this theory nurses can fulfil one of Virginia Henderson's fourteen basic needs which are divided into four parts, namely biological, psychological, sociological, and spiritual (Ladesvita et al., 2021; Negara et al., 2018; Urbaek et al., 2020; Anggaraini et al., 2021).

In carrying out nursing care using Virginia Henderson's nursing theory, nurses can provide care regarding psychological and sociological problems of patients with chronic kidney disease who have edema problems in the lower extremities. The purpose of this study was to determine the Application of the Combination of Ankle Pump Exercise and Contrast Bath on Decreasing Edema Diameter in Patients with Chronic Kidney Disease with the Virginia Henderson Theory Approach in the Non-Trauma Emergency Room of RSUP. Prof. DR. R.D. Kandou Manado.

## **2 METHODS**

The research design used is a descriptive method with a case study approach in patients with Chronic Kidney Disease. using Evidence Based Nursing with the Virginia Henderson approach in the Non-Trauma Emergency Room of the RSUP. Prof. Dr. R.D. Kandou Manado. The sample determination was carried out using purposive sampling technique, namely the technique of determining the sample according to the research needs, namely 4 samples of patients admitted to the emergency department of Prof. Dr. R.D. Kandou Manado.

The sample determination was carried out using purposive sampling technique, namely the technique of determining the sample according to the research needs, namely 4 samples of patients admitted to the emergency department of Prof. Dr. R.D. Kandou Manado. Determination of samples based on inclusion criteria and exclusion criteria. The location and time of the study were carried out for 7 weeks starting from 30 January - 11 March 2023 in the Non-Trauma Emergency Room of the Hospital. Prof. Dr. R.D. Kandou Manado. In managing nursing cases, the method used by the author is nursing care with Virginia Henderson's theoretical approach. Primary data collection techniques in this study are data obtained through observation sheets to assess the decrease in patient edema using an edema degree scale assessment. with a nursing care approach using Virginia Henderson's theory.

### 3 RESULTS AND DISCUSSION

The results of the case study showed pitting oedema in client Mr.X known before the combined action of ankle pump exercises and contrast bath, the patient's oedema was at degree 4 after the intervention, the degree of oedema in the patient decreased to degree 3. In client Mr.Y it is known that before the combined action of ankle pump exercise and contrast bath, the patient's edema was at degree 3 after the intervention, the degree of edema in the patient decreased to degree 2. In client Mr.z it is known that before the combination of ankle pump exercise and contrast bath, the patient's edema was at degree 4 after the intervention, the degree of edema in the patient decreased to degree 3. In the patient, Mr.XY it is known that before the combination of Ankle Pump Exercise and Contrast Bath, the patient's edema was at grade 3 after the intervention, the degree of edema in the patient decreased to grade 2.

**Table 1.** Degree of edema in managed patients

Patient	Action Implementation	Assesment Before Action (Degree Edema)	Observation After Action (Degree Edema)
Tn. X	February 16 2023	4	3
Tn. Y	February 20 2023	3	2
Tn. Z	February 24 2023	4	3
Tn. XY	February 27 2023	3	2

Based on Table 1, these results indicate that there is a change in the degree of oedema after a combination of Ankle Pumping Exercise and Contrast Baths. This is in line with research conducted by Fathur et al, (2020) which states that the combination of ankle pumping exercises and contrast baths results in a significant decrease in edema (P-value = 0.001), but this study has a weakness because only a small sample was taken 20 respondents.

In principle, according to Utami (2014), ankle pumping exercises utilise the properties of blood vessels which are influenced by the pumping action of the muscles so that with strong muscle contractions, the muscles will compress the blood vessels and the oedema fluid can be carried away in the blood circulation so as to increase oxygen transport capacity, oxidation processes and the amount of Na (Utami, 2014). Meanwhile, according to Purwadi (2015) The effect of contrast shower therapy on leg edema in patients with congestive heart failure, obtained p value = 0.034 <  $\alpha$  (0.05), which means that there is a difference in leg edema in the pretest and posttest control groups on the degree of leg edema (Purwadadi et al., 2015).

This cannot be separated from the procedures carried out correctly, according to Manawan et al (2021) leg exercises in flexion and extension in areas of the foot where there is edema and combined with leg elevation have an effect on reducing the diameter of edema (Budiono & Ristanti, 2019; Abe et al., 2018; Nicolaides et al., 2018; Noor et al., 2023). In the process of reducing the degree of edema, it is also greatly influenced by pharmacological therapy in the hospital, such as the administration of diuretic fluid therapy, as in the case handled by researchers who use furosemide as a diuretic (Andriessen et al., 2017; Kelly et al., 2019; Executive Committe, 2016; Vena et al., 2017).

The time needed by researchers when carrying out the combination of Ankle pump and contract bath exercises is very limited because the action is carried out in the emergency department so that the decrease in the degree of edema in the extremities

does not decrease dramatically, and from the observations of researchers in carrying out this action it is better to do it repeatedly so that the results that appear are more optimal (Bronzwaer et al., 2017; Papismadov et al., 2019; Lavi et al., 2016).

This combination of Ankle Pump Exercise and Contrast Bath is performed for 5-10 seconds per session with an interspersed rest period of 20-25 seconds within a 10-minute time frame. After that, an interval of 5 minutes was given contrast bath therapy, by soaking both feet to the extent of the calf alternately using warm water and cold water in an effort to reduce edema. This therapy uses warm water with a temperature of 36.6° C - 43.3° C and cold water with a temperature between 10°C - 20°C as measured using a thermometer.

This complementary nursing action combined with ankle pump exercises and contrast shower is very useful to accelerate the process of reducing edema in patients with lower extremity edema, and can be used as a procedure taught to clients to be applied alone at home or after the patient is transferred from the Non Trauma Emergency Room.

#### 4 CONCLUSIONS

The nursing assessment of patients with chronic kidney disease is in accordance with Virginia Henderson's theoretical model which emphasises patient independence in dealing with the client's lower limb edema problem. The nursing problem that arises according to the standard nursing diagnosis is hypervolemia. The implementation of Evidence Based Nursing by giving a combination of Ankle Pumping Exercise and Contrast Bath is done by measuring the degree of pitting edema before and after the procedure. The evaluation showed the results before giving the combination of Ankle Pumping Exercise and Contrast Bath to the client (degree of edema 3) and after giving the degree of pitting edema decreased (degree of edema 2) and to the client (degree of edema 4) and after giving the degree of pitting edema decreased (degree of edema 3). The combination of Ankle Pumping Exercise and Contrast Bath is concluded to be effective in reducing the degree of lower extremity edema in chronic kidney disease patients.

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