

## The Relationship of Physical Activity with *Restless Legs Syndrome* in Chronic Kidney Disease Patients in the Hemodialysis Room of Subang District Hospital

Syifa Lestari<sup>1</sup> Rosiah,<sup>2</sup> Minanton,<sup>3</sup>

<sup>1,2,3</sup> Politeknik Negeri Subang

email : [sifalestari2017@gmail.com](mailto:sifalestari2017@gmail.com)

**ABSTRACT:** *Restless legs syndrome (RLS) is a sensorimotor disorder that affects a person's desire to move the legs. Physical activity is considered to be one way to reduce RLS symptoms. The purpose of this study was to analyze the relationship of physical activity with RLS in patients with chronic kidney disease (CKD) in the hemodialysis room of RSUD Kab Subang. This research is a type of quantitative research, correlational descriptive research design using cross-sectional. The sample in this study was 62 respondents, with purposive sampling techniques. Data collection using the Global Physical Activity Questionnaire (GPAQ) and International Restless Legs Syndrome Group (IRLS) questionnaires, and data analysis using the spearman rank test. The results showed that most respondents had a low level of physical activity, with a prevalence of 64.5%, and most respondents experienced severe symptoms of RLS, with a prevalence of 40.3%. Statistical tests show that there is a relationship between the physical activity variable and RLS (p-value 0.001), with the coefficient value is -0.741. It can be concluded that there is a solid relationship between physical activity and RLS in CKD patients in the hemodialysis room of RSUD Kab Subang with an antagonistic relationship direction. It is expected that nurses can intervene in chronic kidney disease patients to perform physical activity in accordance with their ability to reduce RLS.*

**Keywords:** Physical Activity, Restless Legs Syndrome, Chronic Kidney Disease

### 1. INTRODUCTION

Chronic Kidney Disease is a health problem whose incidence continues to increase throughout the world, including in developed and developing countries. Indonesia is one of the countries facing this problem. Chronic kidney disease cannot be cured; hemodialysis therapy, abbreviated as "HD", is simply a therapy performed as a substitute for kidney function. Complications in Chronic Kidney Disease (CKD) patients undergoing Hemodialysis are often fatal problems, one of which is the problem of weight gain between hemodialysis sessions that the body cannot tolerate. This condition can be one of the trigger factors for death in patients undergoing HD (Yang *et al.* 2019).

The large number of cases of CKD over time has resulted in an increased need for treatment, including renal transplantation methods and hemodialysis therapy. Hemodialysis therapy is one of the vital kidney function replacement therapies for CKD patients. However, one of the complications that often arise in CKD patients undergoing hemodialysis therapy is a neurological disorder known as Restless legs syndrome (RLS) (Liu *et al.*, 2022).

According to Nurhusna (2021), in CKD patients undergoing Hemodialysis, as many as 80% of 50 samples experienced RLS. Of these, 36% had moderate RLS, and 24% had severe RLS. The appearance of RLS in CKD patients undergoing Hemodialysis can decrease quality

of life. Most patients with RLS also experience sleep disturbances, anxiety, and depressive symptoms.

*Restless leg syndrome* itself can be reduced when moving, at least during activity. According to *the World Health Organization* (2020), physical activity is any activity that requires the use of energy by organs outside the body. Low levels of physical activity have been identified as independent risk factors for chronic disease. Low physical activity is also considered a cause of death globally. The scientific literature shows that lack of physical activity is a phenomenon that occurs in hemodialysis patients. However, exercise has been shown to be safe and has many positive effects on such patients.

Given that hemodialysis patients report comorbidities associated with physical activity, determining the level of physical activity is essential to planning interventions undertaken to improve their mobility (Filipcic et al., 2021). According to Johansen (2000) in Rosiah et al., (2020), Patients undergoing Hemodialysis tend to experience a decrease in physical activity levels by 20-50%. This decrease is influenced by several factors, namely poor patient health, lack of awareness of the importance of physical activity, psychological factors, especially depression, clinical conditions that interfere with physical activity, diagnosis and treatment received by patients, symptoms of disease and side effects of these treatments can interfere with the patient's ability to move.

## **2. MATERIALS AND METHODS**

This type of research is quantitative research, using a correlational descriptive research design with a *cross sectional approach*. The population in this study was all chronic kidney disease patients undergoing hemodialysis at Subang District Hospital, as many as 164 people. Samples were taken from as many as 62 people using sampling techniques using *purposive sampling*. The research instrument used a demographic questionnaire of respondents consisting of age, gender, education and length of hemodialysis. *Global Physical Activity Questionnaire*(GPAQ) This questionnaire contains 16 questions; questions lead in 4 domains, namely, activities at work, travel from place to place, recreational activities and sedentary activities. The *Global Physical Activity Questionnaire* (GPAQ) was adopted from Dandi's (2020) research and tested for validity and reliability with *Cronbach Alpha* results of 0.765. Moreover, the *International Restless Legs Syndrome Group* (IRLS) questionnaire contains ten questions. In this questionnaire, each question consists of 5 points with a range of points 0-4. The assessment provisions are 0= no symptoms, 1= enough, 2= moderate, 3= severe, and 4= very severe, with a score range of 0-4. This questionnaire was adopted from Yusuf's (2018)

research which has been modified by Gusri's (2021) research, which has been tested for validity and reliability with *Cronbach Alpha* results of 0.840. In this study, univariate analysis will be presented in the form of a frequency distribution table of independent variables and related variables—analysis of bivariate data using the computerized assistance of SPSS 23. The statistical test used in this study is the *Spearman rank* test. This statistic is used to test the correlation hypothesis with data on both variable's ordinal scales (in the form of levels), with a *p-value* of 0.5.

### 3. RESULTS

**Table 1. Distribution of Respondent Characteristics Based on Age Data**

| Variabel | Mean | Std.deviasi | Maximum | Minimum |
|----------|------|-------------|---------|---------|
| Usia     | 49,6 | 6.586       | 60      | 35      |

Berdasarkan tabel di atas distribusi karakteristik usia responden didapatkan bahwa usia rata-rata responden adalah 49,6 tahun dengan responden usia terendah yaitu 35 tahun dan responden usia tertinggi yaitu 60 tahun serta standar deviasi 6,586.

**Table 2. Distribution of Respondent Characteristics Based on Gender**

| Jenis Kelamin | Frekuensi (f) | Presentase (%) |
|---------------|---------------|----------------|
| Laki-laki     | 36            | 58,1           |
| Perempuan     | 26            | 41,9           |
| Total         | 62            | 100            |

Berdasarkan tabel di atas distribusi karakteristik jenis kelamin responden didapatkan bahwa sebagian besar adalah jenis kelamin laki-laki sebanyak 58,1 % dan sebagian kecil perempuan sebanyak 47,9%.

**Table 3. Distribution of Respondent Characteristics Based on Education**

| Pendidikan       | Frekuensi (f) | Presentase (%) |
|------------------|---------------|----------------|
| Tidak Sekolah    | 2             | 3,2            |
| SD               | 22            | 35,5           |
| SMP              | 16            | 25,8           |
| SMA              | 14            | 22,6           |
| Perguruan Tinggi | 8             | 12,9           |
| Total            | 62            | 100            |

Berdasarkan tabel di atas distribusi karakteristik Pendidikan responden didapatkan hasil bahwa sebagian besar adalah berpendidikan SD sebanyak 35,5 %.

**Table 4. Distribution of Respondent Characteristic Based on Pekerjaan**

| Pekerjaan     | Frekuensi (f) | Presentase (%) |
|---------------|---------------|----------------|
| Tidak Bekerja | 25            | 40,3           |
| PNS           | 8             | 12,9           |
| Wiraswasta    | 23            | 37,1           |
| TNI/Polri     | 6             | 9,7            |
| Total         | 62            | 100            |

Berdasarkan tabel di atas distribusi karakteristik pekerjaan responden didapatkan bahwa sebagian besar adalah tidak bekerja sebanyak 40,3 %.

**Table 5. Distribution of Respondent Characteristic Based on Lama Menjalani Hemodialisa**

| Lama HD   | Frekuensi (f) | Presentase (%) |
|-----------|---------------|----------------|
| <1 tahun  | 16            | 25,8           |
| 1-5 tahun | 28            | 45,2           |
| >5 tahun  | 18            | 29,0           |
| Total     | 62            | 100            |

Berdasarkan tabel di atas distribusi lama HD responden didapatkan bahwa sebagian besar adalah lama HD 1-5 tahun sebanyak 45,2 %.

**Table 6. Physical Activity Distribution**

| Physical Activity | N  | %    |
|-------------------|----|------|
| Low               | 40 | 64,5 |
| Keep              | 14 | 22,6 |
| Tall              | 8  | 12,9 |

Based on Table 6 of the distribution of respondents' physical activity in chronic kidney disease patients in the Hemodialysis room, it was found that most of them were in a low category, as much as 64.5%, the medium category, as much as 22.6% and very few from the high category as much as 12.9%.

**Table 7. Distribution of Restless Legs Syndrome**

| <i>Restless legs syndrome</i> | N  | %    |
|-------------------------------|----|------|
| Not severe                    | 7  | 11,3 |
| Light                         | 1  | 1,6  |
| Keep                          | 13 | 21,0 |
| Quite severe                  | 25 | 40,3 |
| Very severe                   | 16 | 25,8 |

Table 7 shows the distribution of *restless legs syndrome* in chronic kidney disease patients in the hemodialysis room, Mainly in the derate lythe severe category, with a prevalence of as high as 40.3%, slightly in the very severe category, with a prevalence of 25.8%, in the moderate

category, *r*, with a prevalence of 21.0%, in the non-severe category, with a prevalence of 11.3%, and very little in them the mild category, with a prevalence of 1.6%.

**Table 8. Relationship of Physical Activity with *Restless legs syndrome***

| Activity<br>Physical | Restless Legs Syndrome |     |        |     |        |      |             |      |              |      | Total |      |
|----------------------|------------------------|-----|--------|-----|--------|------|-------------|------|--------------|------|-------|------|
|                      | Tidak Parah            |     | Ringan |     | Sedang |      | Cukup parah |      | Sangat Parah |      |       |      |
|                      | f                      | %   | f      | %   | f      | %    | f           | %    | f            | %    | f     | %    |
| Low                  | 0                      | 0,0 | 0      | 0,0 | 1      | 1,6  | 25          | 40,3 | 14           | 22,6 | 40    | 64,5 |
| Keep                 | 0                      | 0,0 | 1      | 1,6 | 10     | 16,1 | 2           | 3,2  | 0            | 0,0  | 13    | 21,0 |
| Tall                 | 6                      | 9,7 | 1      | 1,6 | 1      | 1,6  | 0           | 0,0  | 1            | 1,6  | 9     | 14,5 |
| Total                | 6                      | 9,7 | 2      | 3,2 | 12     | 19,4 | 27          | 43,5 | 15           | 24,2 | 62    | 100  |
| P-value              |                        |     |        |     |        |      | 0,001       |      |              |      |       |      |
| Coefficient          |                        |     |        |     |        |      | -0,741      |      |              |      |       |      |

They are based on statistical tests in Table 4 on the relationship of physical activity with *restless legs syndrome* in chronic kidney disease patients in the hemodialysis room, using the *Spearman rank test*. The results of a significant relationship are obtained, evidenced by a *p*-value of 0.001, which is smaller than the *p*-value of  $<0.05$ , then the hypothesis is accepted with a solid relationship evidenced by the value of the coefficient is -0.741. However, the opposite direction or negative relationship direction means that the lower the level of physical activity, the level of *restless legs syndrome symptoms* is high, and vice versa. If the level of physical activity is high, then the level of *restless legs syndrome symptoms* is low.

#### 4. DISCUSSION

##### Aktivitas Fisik Pada Pasien Penyakit Ginjal Kronis di Ruang Hemodialisa

Berdasarkan hasil penelitian, dari 62 responden dapat diketahui bahwa tingkat aktivitas fisik pada pasien penyakit ginjal kronis di ruang hemodialisa didapatkan hasil bahwa sebagian besar responden memiliki tingkat aktivitas fisik yang rendah (64,5%). Aktivitas fisik yang rendah karena pasien yang menjalani terapi hemodialisa sering merasa lelah. Aktivitas fisik dan fungsi fisik pada pasien penyakit ginjal kronis dapat berkontribusi pada persepsi kualitas hidup. Fungsi fisik dikaitkan dengan kualitas hidup yang berhubungan dengan kesehatan pada pasien hemodialisa. Berkurangnya fungsi fisik dan kekuatan otot yang lebih rendah mempengaruhi kemampuan untuk melakukan aktivitas sehari-hari dan berdampak pada kualitas hidup. Tingkat aktivitas fisik yang memuaskan dapat berkontribusi pada persepsi kualitas hidup yang lebih besar dan pasien yang mematuhi aktivitas fisik memiliki kualitas hidup yang lebih baik secara signifikan (Painter *et al.*, 2019).

Sehingga dapat disimpulkan selain faktor hemodialisa dan penyakit PGK yang dialami ada banyak faktor yang berpengaruh pada penurunan aktivitas fisik pasien penyakit ginjal kronis antara lain yaitu usia, jenis kelamin, dan pola hidup yang tidak sehat seperti merokok. Pasien dengan penyakit ginjal kronis akan lebih baik jika meningkatkan aktivitas fisik sesuai dengan kemampuannya demi tercapainya kualitas hidup yang lebih baik. Menurut Juwita (2019) pasien penyakit ginjal kronis yang menjalani hemodialisa dapat melakukan aktivitas fisik seperti melakukan kegiatan rumah tangga dan disarankan untuk menghindari pekerjaan yang berat. Maka, aktivitas fisik pada pasien dengan PGK yang menjalani hemodialisa harus terkontrol dengan baik.

### **Restless legs syndrome Pada Pasien Penyakit Ginjal Kronis di Ruang Hemodialisa**

Berdasarkan hasil penelitian tingkat keparahan *Restless legs syndrome* pada pasien penyakit ginjal kronis di ruang hemodialisa menunjukkan bahwa dari 62 responden, didapatkan hasil sebagian besar (40,3 %) responden termasuk kedalam kategori yang cukup parah. Hilangnya fungsi ginjal dapat menyebabkan kurangnya kadar zat besi yang ada didalam tubuh. Konsentrasi zat besi dalam darah mengikuti ritme sirkadian, dan konsentrasi zat besi dalam darah pada malam hari lebih rendah dibandingkan pada siang hari, perubahan zat besi pada malam hari ini berhubungan dengan timbul dan perburukan gejala *restless legs syndrome* di malam hari (Masruro *et al.*, 2020). Hasil penelitian ini didukung dengan hasil penelitian yang dilakukan oleh Xiao-Wei *et al.*, (2019) menyatakan bahwa dari 137 responden terdapat 20,44 % yang mengalami kejadian *restless legs syndrome*.

Hal ini terjadi karena RLS merupakan sindrom yang sering terjadi pada pasien hemodialisa karena terjadinya anemia defisiensi zat besi. Defisiensi zat besi sangat berperan atas kejadian *restless legs syndrome* dikarenakan zat besi penting bagi tubuh untuk proses sintesis dopamin, yang bertugas untuk mengontrol fungsi otot (Andre, 2021). Selain hal diatas, ada beberapa hal yang dapat mempengaruhi tingkat keparahan *restless leg syndrome*, antara lain adalah lamanya menjalani HD (Hartini *et al.*).

Sehingga dapat disimpulkan bahwa *restless legs syndrome* dapat timbul karena proses dialisis yang sudah lama dilakukan, hal tersebut menimbulkan gejala anemia dan kurangnya zat besi didalam tubuh sehingga memperbesar peluang terjadinya RLS.

### **Hubungan Aktivitas Fisik Pada Pasien Penyakit Ginjal Kronis di Ruang Hemodialisa**

The results showed that there was a relationship between physical activity variables and *restless legs syndrome* in patients with chronic kidney disease, as evidenced by the results of the *Spearman rank test* obtained a p-value of 0.001. The value of the coefficient obtained results of -0.741, which states that the relationship between variables is very large or very

strong with the direction of the negative relationship, which means that the lower the level of physical activity, the higher the severity of *restless legs syndrome* and the higher the level of physical activity, the lower the severity of *restless leg syndrome*.

The problem faced by chronic kidney disease patients undergoing hemodialysis is less able to perform physical activities as usual. The decrease in physical activity that occurs in hemodialysis patients is caused by poor physical condition and also several factors such as age, gender, and occupation. In addition, hemodialysis is performed two to three times a week and must be performed for life, making the patient feel bored and tired and can hinder regular physical activity. In addition, patients with chronic kidney disease undergoing hemodialysis also experience side effects in the form of restless legs syndrome (Painter et al., 2019).

Some studies say that physical activity is a factor that can affect *restless legs syndrome* symptoms because good physical activity will reduce the severity of *restless legs syndrome symptoms* (Aukerman et al., 2019). Physical activity in the form of strength training is a stimulus for functional and metabolic adaptation to the neuromuscular. Physical activity is believed to balance dopamine production by endorphin hormones. The increase in these hormones is what causes a decrease in the severity of *restless legs syndrome* (Anggriyani, 2019)

According to Dzulfachri *et al.* (2021), physical activity is recommended for patients suffering from RLS because it releases endorphins that can reduce stress and anxiety. This can promote relaxation and better sleep, regulate circadian rhythms, and engage in mood regulation and relaxation that can reduce the symptoms of restless legs syndrome.

Researchers argue that physical activity can affect the health of individuals, such as patients with chronic kidney disease. In carrying out daily activities, high activity can reduce or avoid symptoms of *restless legs syndrome*. That way, a high level of activity will provide a good level of health. A good patient lifestyle will not cause side effects such as *restless legs syndrome*.

Researchers are aware of limitations in the implementation of research. One limitation is that this study did not filter HD respondents with other diseases, even though RLS does not only occur in CKD patients but can also occur in patients with Diabetes Mellitus and diseases of the nervous system, such as stroke. In addition, researchers only examined the correlation between physical activity and *restless legs syndrome* so as not to intervene with respondents.



## 5. CONCLUSION

Based on the results of the study, it can be concluded that there is a relationship between physical activity and *restless legs syndrome* in patients with chronic kidney disease in the Hemodialysis Room of Subang Regency Hospital, evidenced by a p-value of 0.001 with a solid relationship evidenced by the value of the coefficient is -0.741 which means that the lower the level of physical activity, the level of symptoms of *restless legs syndrome* High and vice versa if the level of physical activity is high then the level of symptoms of *restless legs syndrome* is low. The results of this study can be used as a reference for future research to explore further appropriate efforts or actions to overcome the problem of *restless legs syndrome*.

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