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Research Article

The Effect of *Mindfulness Based Stress Reduction* (MBSR) on Anxiety Levels of Hemodialysis Patients at RSD KRMT Wongsonegoro, Semarang City

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Abstract. Chronic kidney disease (CKD) is identified by a decrease in the glomerular filtration rate (GFR <60 mL/min/1.73) over a period of more than three months. Patients undergoing hemodialysis often experience anxiety due to the intense therapy routine and lifestyle limitations. This condition requires effective anxiety management. This study analyzes the effect of *Mindfulness-Based Stress Reduction* (MBSR) on anxiety levels in hemodialysis patients. The research design used was quantitative with a one-group pre-test post-test approach to evaluate the effectiveness of MBSR. Data were collected using the *GAD-7 questionnaire*. The research sample used *purposive sampling* of 88 respondents, analyzed using the Wilcoxon test. The findings showed that 68 respondents experienced a decrease in anxiety, 0 respondents experienced an increase, and 1 respondent experienced a decrease in anxiety. 20 respondents (*ties*) which did not experience an increase or decrease in anxiety levels. The *p-value sign value* = 0.000 or p < 0.05, the conclusion is 0.000 < α (0.05) then Ho is rejected and Ha is accepted which means there is an effect of MBSR therapy on the anxiety levels of hemodialysis patients. The conclusion obtained is that MBSR has an influence on the anxiety level of hemodialysis patients.

Keywords: Anxiety; Chronic Kidney Disease; Hemodialysis; Mindfulness-Based Stress Reduction; Wilcoxon Test.

1. BACKGROUND

Chronic kidney disease (CKD) is a clinical condition in which kidney function is impaired for at least three months, characterized by a decrease in the glomerular filtration rate (GFR) <60 mL/min/1.73 or the presence of kidney damage. In the early stages of chronic kidney disease, the decline in kidney function often occurs without any clear signs and serum creatinine and urea levels are still normal. Typical symptoms will appear in stages 4 or 5 of chronic kidney disease (Prasetya DCT, Pateda SM, Ihsan M, Yusuf MNS, 2024) .

According to data from the World Health Organization (WHO), in 2020 there were 254,028 deaths due to chronic kidney failure. The number of cases increased significantly in 2021 to more than 843.6 million, and the death rate is projected to increase by 41.5% by 2040 (Hermansyah, 2024) . Data from the Ministry of Health of the Republic of Indonesia in 2023 showed that there were 499,800 Indonesians suffering from chronic kidney failure. The number of patients with indications for hemodialysis reached 66,433 people, with 132,142 patients recorded as actively undergoing hemodialysis therapy (Grace, 2024) . The incidence of chronic kidney failure in Central Java in 2023 was reported to have reached 13,886 sufferers, or approximately 0.3% higher than the average percentage throughout Indonesia, which was 0.2% (Putri et al., 2024) .

When end-stage kidney failure reaches the stage, patients will require therapy to sustain their lives. Some treatments for chronic kidney failure include fluid restriction, dialysis (hemodialysis), kidney transplantation, and a recommended kidney failure diet, including a protein-rich diet, potassium-rich diet, and a low-calorie diet. A kidney diet is important for kidney failure patients, whether they have or have not undergone dialysis (Indah Lestari et al., 2023) . Hemodialysis is a method of cleansing the blood of body waste and is used as the primary treatment for chronic kidney failure patients or as short-

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term therapy for acutely ill patients (Ulfa & Susanto, 2023) . Chronic kidney failure patients who regularly undergo hemodialysis often experience psychological conditions, one of which is anxiety (Indriyati & Herawati, 2022) .

Anxiety is triggered by the need to completely change a lifetime's lifestyle, including the obligation to undergo therapy 2-3 times a week, strict adherence to medication and diet, and fluid restrictions. Furthermore, a lack of understanding of the hemodialysis procedure and side effects, as well as fear of the insertion and the unpredictable nature of the pain, contribute to anxiety. (Damanik, 2020) (Marisi Dame et al., 2022) . Anxiety management can be done through prevention and therapy. Anxiety management with therapy includes pharmacological and non-pharmacological therapies. Pharmacological therapy can be done by administering psychopharmacological therapy and somatic therapy. Non-pharmacological therapies include music therapy, using aromatherapy, and *Mindfulness-Based Stress Reduction* (MBSR) therapy (Pragholapati et al., 2021) . This program combines *mindfulness meditation practices* with elements of psychology to help individuals manage stress, anxiety, and various physical and mental health issues. The main focus of MBSR is practicing mindfulness in the present moment. Program participants are taught various meditation techniques, including body scans, sitting meditation, and gentle yoga, all designed to increase awareness of bodily sensations, thoughts, and emotions. Individuals learn to observe their internal experiences with an attitude of acceptance and openness, rather than reacting automatically or avoiding them (Syafii et al., 2024) .

2. THEORETICAL STUDY

Definition of Chronic Kidney Failure (CKF)

Permanent kidney dysfunction lasting more than three months. This condition is classified based on the cause, glomerular filtration rate (GFR), and albuminuria levels. In addition to reduced kidney function, CKD can lead to various serious complications such as malnutrition, fluid overload, bleeding, serositis, depression, cognitive impairment, peripheral neuropathy, infertility, and infection. (Isa et al., 2024)

Definition of Hemodialysis

Hemodialysis is a kidney replacement therapy that works by filtering blood through a semipermeable membrane using dialysate fluid to remove metabolic waste and excess fluid. (Aini & Arifianto, 2024)

Definition of Anxiety

Anxiety is a feeling of fear and worry about possible future events that are considered difficult to control and perceived as threatening (Aseta et al., 2023) . Furthermore, according to Manurung (2021), anxiety is also understood as a subjective experience of mental tension and restlessness that arises as a common response when an individual feels unable to face a problem or loses a sense of security.

Definition of *Mindfulness Based Stress Reduction* (MBSR)

A program created by John Kabat-Zinn in the 1970s, designed to help people cope with stress, anxiety, and a variety of emotional and physical problems. The program combines yoga, mindfulness meditation, and body awareness techniques to increase awareness and encourage non-judgmental acceptance of present-moment experiences. MBSR functions as a therapeutic approach that uses cognitive strategies to accept experiences, allowing individuals to concentrate and feel more comfortable in their current state without linking it to negative past experiences. (Darusman, 2023)

3. RESEARCH METHODS

This study was conducted quantitatively with a quasi-experimental method, a one-group pre-test post-test approach. The population of all chronic kidney failure patients undergoing hemodialysis at RSD KRMT Wongsonegoro Semarang City was 113 respondents, with a sample size of 88 respondents with sample provisions including: Inclusion criteria: patients who have been diagnosed with chronic kidney failure by a doctor, have never participated in the MBSR program, Patients who experience anxiety as measured by the GAD-7 scale, Able to communicate, read and write, Willing to participate in the study as evidenced by informed consent. Exclusion criteria: unwilling to be research respondents, respondents who experience decreased consciousness, severe and prolonged

mental health conditions, neurological conditions and respiratory conditions. This research procedure was obtained by administering the GAD-7 questionnaire to see the level of anxiety in hemodialysis patients. This questionnaire has been tested and has a sensitivity value of 68.94% and has been tested valid with a validity value of 0.648-0.800. (Sugiono et al., 2020) . The reliability test had an overall reliability coefficient (*Crombach's Alpha*) of 0.867 (Adhyartasari et al., 2024)

Based on these results, the GAD-7 questionnaire was declared valid and reliable.

4. RESULTS AND DISCUSSION

Data were collected from 88 respondents from October to November 2025 in the hemodialysis room of KRMT Wongsonegoro Regional Hospital, Semarang City. The *Mindfulness-Based Stress Reduction* (MBSR) intervention was used as a data collection method to reduce anxiety in hemodialysis patients. The following information was collected based on the research findings:

Respondent Characteristics

Table 1 Respondent Characteristics.

Respondent Identity	Frequency (n)	Percentage (%)
Age		
Late Adolescence 17-25 years	2	2.3
Early Adulthood 26 – 35 years	3	3.4
Late Adulthood 36-45 years	5	5.7
Early Elderly Age 46-55 years	22	25.0
Late Elderly Age 56-65 years	37	42.0
Seniors >65 years old	19	21.6
Total	88	100
Gender		
Man	42	47.7
Woman	46	52.3
Total	88	100
Education		
Elementary School	26	29.5
JUNIOR HIGH SCHOOL	27	30.7
SENIOR HIGH SCHOOL	16	18.2
College	19	21.6
Total	88	100
Employment Status		
Doesn't work	49	55.7
Work	39	44.3
Total	88	100
HD Time		
< 6 months	64	72.7
> 6 months	24	27.3
Total	88	100

Table 1 shows that the majority of respondents were in the age range of 56 to 65 years, as many as 37 (42%), respondents regarding gender were 46 respondents (52.3%) female, the majority of education levels were junior high school level, namely 27 respondents (30.7%), the majority of respondents' employment status was unemployed, as many as 49 respondents (55.7%), and the majority of respondents had been undergoing HD for <6 months, namely 64 respondents (72.7%).

Before Intervention

Table 2 Anxiety before intervention.

Pre-Test			
Anxiety	**Information**	**Frequency (n)**	**Percentage (%)**
	There isn't any	0	0
	Light	9	10.2
	Currently	30	34.1
	Heavy	49	55.7
	Total	88	100

The frequency distribution of respondents before the MBSR intervention was carried out on the anxiety level of hemodialysis patients showed that 0 respondents (0%) had no anxiety, 9 respondents (10.2%) had mild anxiety, 30 respondents (34.1%) had moderate anxiety, 49 respondents (55.7%) had severe anxiety.

After Intervention

Table 3 Anxiety after intervention.

Post Test			
Anxiety	**Information**	**Frequency (n)**	**Percentage (%)**
	There isn't any	12	13.6
	Light	32	36.4
	Currently	44	50
	Heavy	0	0
	Total	88	100

The frequency distribution of respondents after the MBSR intervention on the anxiety level of hemodialysis patients showed that 12 respondents (13.6%) had no anxiety, 32 respondents (36.4%) had mild anxiety, 44 respondents (50%) had moderate anxiety, and 0 respondents (0%) had severe anxiety.

The Effect of *Mindfulness Based Stress Reduction* (MBSR) on Anxiety Levels in Hemodialysis Patients

Table 4 Effect of MBSR on Anxiety Levels of Hemodialysis Patients.

		N	Mean Rank	Sum of Rank	Z	P-Value
Pre - Post	Negative Ranks	68	34.50	2346.00	-7,719	0,000
	Positive Ranks	0	.00	.00		
	Ties	20				
	Total	88				

Table 4 shows the *Negative Ranks value* of 68 respondents. This means that there are 68 respondents who experienced a decrease in anxiety after being given *Mindfulness Based Stress Reduction* (MBSR). *The Mean Ranks value* or average decrease in anxiety is 34.50 which indicates that the decrease in anxiety that occurred has a fairly significant magnitude, while the Sum of Rank is 2346.00 which indicates a tendency for a consistent decrease in anxiety in most respondents. On the other hand, Positive Ranks are indicated by 0 respondents who showed no increase in anxiety after being given the MBSR intervention. This indicates that MBSR therapy does not have a negative effect on the patient's psychological condition. Meanwhile, there was also a tie value (equality) of 20 respondents who did not experience a change in anxiety levels before and after being given the MBSR intervention. This condition is influenced by several factors, such as differences in

individual abilities in accepting and applying *Mindfulness Based Stress Reduction* (MBSR) therapy, a relatively low initial level of anxiety, less than optimal duration and intensity of therapy, as well as psychological factors and the patient's physical condition.

DISCUSSION

Respondent Characteristics

1) Age

The results of the study based on the age of chronic kidney failure patients in the hemodialysis room at RSD KRMT Wongsonegoro Semarang City showed that the majority of respondents were aged 56 to 65 years, as many as 37 (42%). The results of this study are in line with (Febrianasari et al., 2025) this is caused by a decline in kidney capacity that occurs at the age of over 40 years, which is a form of degenerative condition experienced by humans. Hemodialysis therapy is more common in the 56-65 year age range, because they are more susceptible to complications that can worsen kidney function more severely compared to those under 40 years of age. According to (Shakila et al., 2023) there are most patients aged 56 to 65 years or as many as 34 (58.6%). As the elderly age, they will experience a decline in body function and the emergence of various diseases including chronic kidney failure. This condition has an impact on a significant decline in quality of life for the elderly. The changes that occur in the psychological, social and environmental aspects of their lives correlatively contribute to their overall well-being.

2) Gender

Research conducted in the hemodialysis unit of KRMT Wongsonegoro Regional Hospital in Semarang City demonstrated that most chronic kidney failure patients were female, comprising 46 respondents (52.3%). This finding aligns with Widyawati et al.'s (2023) report that 60% of respondents with chronic kidney failure were female. Rusdi et al.'s (2023) report also found that 28 (56%) respondents were female. Chronic kidney failure is reported to occur more frequently in women than in men, with differences in prognostic factors, including blood sugar control in women and proteinuria in men, both of which are related to dietary intake. The high prevalence of chronic kidney failure in women also increases the risk of passing the disease on to the next generation, potentially increasing the burden of non-communicable diseases in the future if not accompanied by adequate intervention and access to healthcare services.

3) Education

The results of the study based on education showed that the majority of patients had a junior high school education, as many as 27 respondents (30.7%). These results are supported by (Damayantie, 2022) who showed that most chronic kidney failure patients undergoing hemodialysis had a junior high school education, namely 40 respondents (52.6%). Education level plays a significant role because an educated person will have a better understanding of health, be able to implement a healthy lifestyle, and reduce the risk of decreased kidney function. According to (Saragih, Nurlela Petra Theresia Ivana Sianipar, Ruisna Wati Naibaho, 2022) with a proportion of patients with a junior high school education of 16 people (40%). Low levels of education can limit understanding of health information, thereby increasing the risk of chronic disease, as well as hindering the ability to manage disease and access optimal health services.

4) Employment Status

The results of the study based on employment status showed that 49 respondents (55.7%) were unemployed. This is in line with research (Natalia et al., 2023) explaining that some respondents in this study were unemployed, namely 26 (86.7%). Because patients who are already in the end-stage renal disease stage must undergo hemodialysis and this is why many of these patients decide not to work because to avoid their disease getting worse and lack of motivation to live, so sufferers choose to relax at home rather than having to work. According to (Cahyono, 2023) respondents in this study were unemployed, namely 47 (38.5%). CKD patients are vulnerable to losing their jobs due to physical limitations, post-hemodialysis fatigue,

and the emergence of complications, making it difficult for them to maintain employment.

5) HD Time

The results of the study based on the duration of HD of chronic kidney failure patients in the hemodialysis room at RSD KRMT Wongsonegoro, Semarang City, showed that 64 respondents (72.7%) were respondents who underwent HD for <6 months. This is in line with the results of the study (Syamsuddin et al., 2023). Based on the duration of patients undergoing hemodialysis, the most data obtained were less than 6 months of hemodialysis, with 20 respondents (33.3%). The initial duration of HD is a critical period where patients must adapt to new treatment routines, significant lifestyle changes, and dependence on the dialysis machine. According to (Rahman et al., 2023) Based on the duration of patients undergoing hemodialysis, the most data obtained were less than 6 months of hemodialysis, with 10 respondents (40%). Patients who have just undergone hemodialysis or less than six months of treatment on average experienced increased anxiety. Usually, because in the initial period of kidney failure diagnosis, patients feel hopeless about their health status and cannot return to their previous condition. After ongoing therapy or having received regular treatment, the patient begins to adapt to their condition, and there will be a decrease in anxiety levels.

Before Intervention

Based on research results obtained by researchers at RSD KRMT Wongsonegoro, Semarang City, the results obtained by respondents before the MBSR intervention on the level of anxiety of hemodialysis patients showed that 49 respondents (55.7%) had a high level of anxiety. This finding is similar to (Misdiyanti et al., 2022). Patients undergoing hemodialysis often face various health problems, one of which is psychological problems such as anxiety. Anxiety in CKD patients undergoing hemodialysis generally arises from excessive worry about something that may not necessarily happen, so that the feelings of fear experienced are unclear. This condition can disrupt concentration and daily activities, even causing individuals to avoid situations that trigger anxiety. According to (Siregar et al., 2022) Anxiety negatively impacts hemodialysis patients, requiring nursing intervention to reduce it. One non-pharmacological approach that can be implemented is mindfulness, a practice of awareness that involves consciously and calmly accepting the present moment.

After Intervention

Based on research results obtained by researchers at KRMT Wongsonegoro Regional Hospital, Semarang City, the results obtained after the *MBRS intervention* on the anxiety levels of hemodialysis patients showed that 44 respondents (50%) had moderate anxiety levels. This is demonstrated by the results (Akbar et al., 2023). Chronic kidney disease patients undergoing hemodialysis often face physical and psychological challenges, such as fatigue, nausea, and mood swings that can trigger anxiety. To address these challenges, practicing mindfulness can be a tool to distract from negative symptoms while building inner peace and enthusiasm by focusing on optimistic thoughts. According to (Blum et al., 2021) Mindfulness meditation has the potential to be an effective and rapid intervention in reducing anxiety in patients. The study also examined the relationship between patient demographic and clinical characteristics and the effectiveness of mindfulness meditation on anxiety. The results of this analysis showed a significant reduction in anxiety after treatment, independent of patient age, gender, and previous mindfulness meditation experience. The mindfulness meditation group was able to reduce anxiety regardless of previous experience.

The Effect of Mindfulness Based Stress Reduction (MBSR) on Anxiety Levels in Hemodialysis Patients

Based on the results of the study on the effect of MBSR on the anxiety levels of hemodialysis patients at KRMT Wongsonegoro Regional Hospital in Semarang City, the Wilcoxon test showed a significance value of p-value = 0.000 ($p < 0.05$). Thus, H_0 was rejected and H_a was accepted, meaning that there was a significant effect of MBSR intervention on reducing the anxiety levels of hemodialysis patients.

The success of this intervention is also supported by the individual's strong self-control skills, enabling the patient to effectively manage their thoughts and responses during the intervention. The Success of *Mindfulness-Based Stress Reduction* (MBSR) depends on supporting factors. Self-control is a person's ability to regulate their thoughts, circumstances, and reactions toward a goal (Makmur et al., 2024). *Mindfulness-Based Stress Reduction (MBSR)* therapy has been shown to have a positive impact on reducing anxiety. Through intensive *Mindfulness-Based Stress Reduction* (MBSR) therapy training, this therapy helps individuals learn to recognize bodily sensations and apply mindfulness to daily activities. The goal is for patients to manage anxiety and understand their psychophysical condition objectively and openly. Mindfulness therapy can encourage positive thinking, self-compassion, reduce repetitive thought patterns, anxiety, the risk of depressive relapse, post-traumatic stress symptoms, perceived stress, and overall psychological distress. (Arsyi et al., 2024)

Individuals undergoing hemodialysis therapy generally experience anxiety. This occurs because this therapy is lifelong and highly dependent on hemodialysis equipment. Over time, patients who have undergone hemodialysis for a long time will gain more knowledge and experience, making them better able to adapt to various stresses. Therefore, they tend to accept that hemodialysis therapy is a necessity for maintaining life. Conversely, patients who have recently undergone hemodialysis have a high psychological vulnerability characterized by frequent negative thought patterns. This often triggers severe anxiety, especially such as recurring anxiety, fear of death, uncertainty about the future due to the patient's chronic condition, such as worry about the unpredictability of their illness, anxiety related to relationships with partners, finances, worries about marriage, children, and the stress it places on the family. Furthermore, hemodialysis patients may also face death. They also experience major lifestyle changes, loss of enthusiasm due to restrictions, and feelings of isolation. Unresolved psychological stress has been shown to worsen the patient's mental and physical health (Agustyowati et al., 2023) . These findings align with those of Faulinna et al., 2022, who obtained a *p-value of* -2.637, indicating a decrease in anxiety levels during the post-test in the group receiving MBSR training. The *Mindfulness-Based Stress Reduction training* in this study supports individuals in understanding and being aware of how thoughts, emotions, and behaviors influence physical and psychological health. Furthermore, this therapy emphasizes the importance of managing emotions and thoughts to maintain health and maximize their role performance. According to Astuti et al., 2022 , prior to *Mindfulness therapy* , 27 (79.4%) respondents experienced moderate anxiety, while 29 (85.3%) experienced mild anxiety. Anxiety experienced by patients with chronic kidney failure often arises when undergoing hemodialysis. Unpleasant feelings of anxiety are a person's emotional response to various types of stressors, whether identified (clear) or unidentified (unclear). This is characterized by feelings of excessive worry, fear, and sometimes a sense of threat. From the research results, related research theories, researchers concluded that the influence of *Mindfulness Based Stress Reduction* (MBSR) on the anxiety levels of hemodialysis patients showed a significant decrease in the anxiety scores of hemodialysis patients, with the appropriate *Mindfulness procedures* , namely awareness, Relaxation, attention, appreciation, *body scanning* and acceptance can influence the psychology of the sufferer so that it can reduce the level of anxiety.

5. CONCLUSIONS AND SUGGESTIONS

Based on the research and discussion above with the title "The Effect of *Mindfulness Based Stress Reduction* (MBSR) on the Anxiety Level of Hemodialysis Patients at RSD KRMT Wongsonegoro, Semarang City", it has conclusions including, Characteristics of respondents in the age group are known that the most respondents are in the age range of 56 to 65 years as many as 37 (42%), respondents against the most gender concluded as many as 46 respondents (52.3%) are female, the majority of the highest education level is junior high school level as many as 27 respondents (30.7%), the majority of respondents' employment status is not working as many as 49 respondents (55.7%), and the majority of respondents have been undergoing HD for <6 months as many as 64 respondents (72.7%). The level of anxiety of hemodialysis patients in 2026 before being given intervention with a total of 88 respondents obtained data as many as 49 respondents

(55.7%) who experienced severe anxiety. The anxiety level of hemodialysis patients in 2026 after being given intervention with a total of 88 respondents obtained data of 44 respondents (50%) who experienced moderate anxiety. There is an effect of *Mindfulness Based Stress Reduction* (MBSR) on the anxiety level of hemodialysis patients at RSD KRMT Wongsonegoro Semarang in 2026 with *a p-value* = 0.000 or p < 0.05.

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