

Hemodialysis and the Effects of Exercise on Quality of Life and Depression Symptoms

Amanda Porter, MS CCLS



Objectives

1. The participant will gain a clear understanding of the role of a Child Life Specialist with this unique population.
2. The participant will gain a clear understanding of the impact of dialysis treatments on children ages 10-17 social and emotional health.
3. The participant will describe how cycle ergometry affects the quality of life of hemodialysis patients.

6 Key Goals of a Certified Child Life Specialist

1. Assess coping responses and needs of children and families to healthcare experiences.
2. Minimize stress and anxiety for the child.
3. Prepare children and families for health care experiences.
4. Provide essential life experiences.
5. Create opportunities which strengthen self-esteem and independence.
6. Communicate effectively with other members of the health care team.

Why A Child Life Specialist?

- As a child life specialist, we are trying to normalize the child's environment. That looks different for each patient and each day they spend in the hospital.
- Normal activities for children are being active; whether that's playing sports or going for a walk.
 - We know that dialysis patients don't always have the energy, don't believe they can work out and just don't want to.
 - To provide normalization exercise for these patients in a safe environment to empower them to be physically active outside of their treatments.

Define Physical Fitness/Activity

“The term physical fitness encompasses several basic tenets. These include the individual's ability to perform daily functions with sufficient energy, alertness, and without undue fatigue. Physical activity is differentiated from physical fitness as a concept; physical activity is associated with contractions of muscles, movement of body and pan increased utilization of energy. Overall, physical activity is a structured, planned, and purposeful activity”

Raj, V. M. S., Patel, D. R., & Ramachandran, L. (2017).

ESRD & Physical Activity

- ESRD patients display decreased physical activity in comparison to healthy individuals.
- Hemodialysis patient's vs Non-ESRD patients
 - HD patients have decreased steps taken in a day and less time walking.
 - On non-dialysis days, HD patients had increased physical activity, but not the same level as non-ESRD patients.

Exercise & Hemodialysis in Adults

Literature Review Themes:

- Inactive lifestyle of an ESRD patient
- Quality of life and physical activity
- Depression and physical activity
- Appropriate physical activity for hemodialysis patients

Inactive Lifestyle of Hemodialysis Patients

- ESRD/CKD patients have increased risk of cardiovascular deaths due to inactive lifestyles.
- 80% of adults and adolescents receiving hemodialysis do not reach the World Health Organizations suggestions for physical activity level.
- Side effects of dialysis treatments lead to decreased physical activity
- Lack of motivation decreases desire for physical activity.
- Decreased desire to exercise, fatigue, lack of time, pain from treatment and depression are all reasons why physical inactivity is common with hemodialysis patients.
- Stage 5 (ESRD) hemodialysis patients have low physical function; it is often compared to a 70-year-old who doesn't have ESRD.
- Both hemodialysis and peritoneal dialysis patients had low physical function and low physical activity.

Quality of Life and Physical Activity

- Dialysis patients are known for having decreased quality of life in part to decreased physical activity.
- Physical activity is shown to improve quality of life for chronic hemodialysis patients.
- According to Lima et. al, “Physical exercise and/or physical activity increased patients on chronic hemodialysis’ quality of life.”
- Physical activity for 1 hour, 3 times a week has been shown to improve quality of life for ESRD patients.
- Despite kidney transplants being an option for the ESRD patients, minimized quality of life still affects this population.

Depression and Physical Activity

- “Depression is one of the main symptoms in patients receiving hemodialysis.”
 - Sadness, irritation, low self-esteem, and poor sleep
 - Depression symptoms have a direct correlation to suicidal events
- Depressive symptoms are one of many comorbidities that dialysis patients experience over time.
- Physical activity and mental health are one of many important lifestyles to consider for chronic hemodialysis patients.
- There is a strong correlation with aerobic activity and decreased depressive symptoms and increased quality of life.
- “Bicycle riding is an excellent way to improve the quality of life and reduce the severity of depression and can be used for patients suffering from depression because of chronic hemodialysis.”

Appropriate Physical Activity for Hemodialysis Patients

- Exercise programs should be based on an individualized developed plan for each patient.
- The exercise program should start at a low-intensity and increase to a higher intensity over time to allow the body to acclimate to the exercise.
- Patients see large benefits when utilizing aerobic activity.
- 30 minutes of exercise with values recorded every 10 minutes.
- Strength & Aerobic training were the most studied in relation to hemodialysis patients.
 - Aerobic activity offered in treatment centers can improve physical activity with hemodialysis patients.
 - Intradialytic exercise is one of the leading methods to overcome physical activity in dialysis patients.
- Patients should be able to mimic the exercise they are getting in-center outside of the dialysis unit.

Children's Mercy DEX

- Requirements
- Exclusion Criteria
- Inclusion Criteria
- Aims of the Study
- Length of Study
- Team Members
- Plan of Care



The Children's Mercy dialysis clinic is looking for volunteers aged 10-17.9 years old to participate in an exercise program for kids with stage 5 end stage renal disease.

Participation requires:

- Male or female.
- 10 to 18 years old at the time of data collection.
- Capable of riding recumbent exercise bike during HD treatment.
- Capable of completing two surveys gathering information on depression and Quality of Life.
- Ability to obtain and understand informed consent and assent.



Testing locations at Children's Mercy Adele Hall

(Downtown, Kansas City, MO)

Contact the Amanda Porter, Nephrology Child Life Specialist at **816-234-3000 x51180** to enroll or for more information

Surveys

PedsQL (End Stage Renal Disease Module)

PedsQL 2

In the past ONE month, how much of a problem has this been for you ...

ABOUT MY HEALTH AND ACTIVITIES (problems with...)	Never	Almost Never	Some-times	Often	Almost Always
1. It is hard for me to walk more than one block	0	1	2	3	4
2. It is hard for me to run	0	1	2	3	4
3. It is hard for me to do sports activity or exercise	0	1	2	3	4
4. It is hard for me to lift something heavy	0	1	2	3	4
5. It is hard for me to take a bath or shower by myself	0	1	2	3	4
6. It is hard for me to do chores around the house	0	1	2	3	4
7. I hurt or ache	0	1	2	3	4
8. I have low energy	0	1	2	3	4

ABOUT MY FEELINGS (problems with...)	Never	Almost Never	Some-times	Often	Almost Always
1. I feel afraid or scared	0	1	2	3	4
2. I feel sad or blue	0	1	2	3	4
3. I feel angry	0	1	2	3	4
4. I have trouble sleeping	0	1	2	3	4
5. I worry about what will happen to me	0	1	2	3	4

HOW I GET ALONG WITH OTHERS (problems with...)	Never	Almost Never	Some-times	Often	Almost Always
1. I have trouble getting along with other kids	0	1	2	3	4
2. Other kids do not want to be my friend	0	1	2	3	4
3. Other kids tease me	0	1	2	3	4
4. I cannot do things that other kids my age can do	0	1	2	3	4
5. It is hard to keep up when I play with other kids	0	1	2	3	4

ABOUT SCHOOL (problems with...)	Never	Almost Never	Some-times	Often	Almost Always
1. It is hard to pay attention in class	0	1	2	3	4
2. I forget things	0	1	2	3	4
3. I have trouble keeping up with my schoolwork	0	1	2	3	4
4. I miss school because of not feeling well	0	1	2	3	4
5. I miss school to go to the doctor or hospital	0	1	2	3	4

PedsQL 4.0 - (8-12) Not to be reproduced without permission Copyright © 1998 JW Varni, Ph.D. All rights reserved
 0100
 PedsQL-4.0-Core - US-English
 PedsQL-4.0-Core-C-imp-US-Eng.doc

CES-D Scale

Center for Epidemiologic Studies Depression Scale (CES-D), NIMH

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

	During the Past			
	Rarely or none of the time (less than 1 day)	Some or a little of the time (1-2 days)	Occasionally or a moderate amount of time (3-4 days)	Most or all of the time (5-7 days)
1. I was bothered by things that usually don't bother me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I did not feel like eating; my appetite was poor.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I felt that I could not shake off the blues even with help from my family or friends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I felt I was just as good as other people.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. I had trouble keeping my mind on what I was doing.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. I felt depressed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I felt that everything I did was an effort.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. I felt hopeful about the future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. I thought my life had been a failure.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. I felt fearful.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. My sleep was restless.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I was happy.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. I talked less than usual.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I felt lonely.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. People were unfriendly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. I enjoyed life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. I had crying spells.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I felt sad.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. I felt that people dislike me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. I could not get "going."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SCORING: zero for answers in the first column, 1 for answers in the second column, 2 for answers in the third column, 3 for answers in the fourth column. The scoring of positive items is reversed. Possible range of scores is zero to 60, with the higher scores indicating the presence of more symptomatology.

Data Collection Form

IRB # STUDY00000357

Physical Activity and Hemodialysis Data Collection Form

Date of Test ___/___/___

ID: _____

Session No: _____

Height: _____ Weight: _____ Resting BP: _____

How are you feeling today: _____

Participated

Did Not Participate

Heart Rate (5 Minutes): _____

Heart Rate (10 Minutes): _____

Heart Rate (15 Minutes): _____

Heart Rate (20 Minutes): _____

Heart Rate (25 Minutes): _____

Heart Rate (30 Minutes): _____

Summary

- Adult ESRD patients show decreased physical activity.
- Physical activity has shown an increase in quality of life with adult hemodialysis patients.
- Depression is one of the main symptoms in patients receiving hemodialysis.
- “Bicycle riding is an excellent way to improve the quality of life and reduce the severity of depression and can be used for patients suffering from depression because of chronic hemodialysis.

Questions & Contact Information

Amanda Porter, MS CCLS

Child Life Specialist

Children's Mercy Hospital

Anporter@cmh.edu

816-234-3000 x 51180

References

- Akihiko, K., Nobuyuki, M., Nishi, H., Ujike, K., Hashimoto, H., Kurato, R., & Koumoto, K. (2016). Relationship between Changes in Physical Activity and Changes in Health-related Quality of Life in Patients on Chronic Hemodialysis with 1-Year Follow-up. *Acta Medica Okayama*, 70(5), 353–363.
- Aucella, F., Gesuete, A., & Battaglia, Y. (2014). A “Nephrological” Approach to Physical Activity. *Kidney and Blood Pressure Research*, 39(2-3), 189–196. doi: 10.1159/000355796
- Bae, Y.-H., Lee, S. M., & Jo, J. I. (2015). Aerobic training during hemodialysis improves body composition, muscle function, physical performance, and quality of life in chronic kidney disease patients. *Journal of Physical Therapy Science*, 27(5), 1445–1449. doi: 10.1589/jpts.27.1445
- Brown, P. D. S., Rowed, K., Shearer, J., Macrae, J. M., & Parker, K. (2018). Impact of intradialytic exercise intensity on urea clearance in hemodialysis patients. *Applied Physiology, Nutrition, and Metabolism*, 43(1), 101–104. doi: 10.1139/apnm-2017-046
- Caba, J. (2014, October 2). Adding Exercise To Dialysis Patients' Treatment Could Help Improve Their Physical And Mental Health. Retrieved October 10, 2017, from <https://www.medicaldaily.com/adding-exercise-dialysis-patients-treatment-could-help-improve-their-physical-and-mental-306144>
- Capitanini, A., Lange, S., Dalessandro, C., Salotti, E., Tavoraro, A., Baronti, M. E., ... Cupisti, A. (2014). Dialysis Exercise Team: The Way to Sustain Exercise Programs in Hemodialysis Patients. *Kidney and Blood Pressure Research*, 39(2-3), 129–133. doi: 10.1159/000355787
- Carvalho, E., Reboredo, M., Gomes, E., Teixeira, D., Roberti, N., Mendes, J., ... Pinheiro, B. (2014). Physical Activity in Daily Life Assessed by an Accelerometer in Kidney Transplant Recipients and Hemodialysis Patients. *Transplantation Proceedings*, 46(6), 1713–1717. doi: 10.1016/j.transproceed.2014.05.019
- Gomes, E. P., Reboredo, M. M., Carvalho, E. V., Teixeira, D. R., Carvalho, L. F. C. D. O., Filho, G. F. F., ... Pinheiro, B. D. V. (2015). Physical Activity in Hemodialysis Patients Measured by Triaxial Accelerometer. *BioMed Research International*, 2015, 1–7. doi: 10.1155/2015/645645

References cont'd.

- Johansen, K. L. (2007). Exercise in the End-Stage Renal Disease Population. *Journal of the American Society of Nephrology*, 18(6), 1845–1854. doi: 10.1681/asn.2007010009
- Kang, S. H., Do, J. Y., Jeong, H. Y., Lee, S.-Y., & Kim, J. C. (2017). The Clinical Significance of Physical Activity in Maintenance Dialysis Patients. *Kidney and Blood Pressure Research*, 42(3), 575–586. doi: 10.1159/000480674
- Painter, P. L., Agarwal, A., & Drummond, M. (2017). Physical Function and Physical Activity in Peritoneal Dialysis Patients. *Peritoneal Dialysis International*, 37(6), 598–604. doi: 10.3747/pdi.2016.00256
- Qiu, Z., Zheng, K., Zhang, H., Feng, J., Wang, L., & Zhou, H. (2017). Physical Exercise and Patients with Chronic Renal Failure: A Meta-Analysis. *BioMed Research International*, 2017, 1–8. doi: 10.1155/2017/7191826
- Raj, V. M. S., Patel, D. R., & Ramachandran, L. (2017). Chronic kidney disease and sports participation by children and adolescents. *Translational Pediatrics*, 6(3), 207–214. doi: 10.21037/tp.2017.06.03
- Squires, V. L., & Allen, K. E. (2009). The Emergency Department and Ambulatory Care. In *The Handbook of Child Life* (1st ed., Vol. 1, pp. 287–309). Springfield, IL: Charles C. Thomas.
- Torino, C., Manfredini, F., Bolignano, D., Aucella, F., Baggetta, R., Barillà, A., ...', F. (2014). Physical Performance and Clinical Outcomes in Dialysis Patients: A Secondary Analysis of the Excite Trial. *Kidney and Blood Pressure Research*, 39(2-3), 205–211. doi: 10.1159/000355798
- Zhao, C., Ma, H., Yang, L., & Xiao, Y. (2016). Long-term bicycle riding ameliorates the depression of the patients undergoing hemodialysis by affecting the levels of interleukin-6 and interleukin-18. *Neuropsychiatric Disease and Treatment*, Volume 13, 91–100. doi: 10.2147/ndt.s124630



Children's Mercy
KANSAS CITY