

Effect of Implementing Exercise Training Program on Dialysis Efficacy and Physical Performance of Children Undergoing Hemodialysis

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Abstract: Hemodialysis are affected by uremic syndrome, it is signed by serious health problems. Exercise activity improve muscle blood flow and greater amount of open capillary surface area in working muscles will result in a greater flux of urea and associated toxins from the tissue to the vascular compartment for subsequent removal at the dialysis children's with (ESRD) have decrease physical activities, muscle work, and quality of life (QOL) exercise could improve many indicators of physical functioning, increase self-reported physical functioning, and improve dialysis efficacy in ESR patients.

Aim of the study: Evaluate the effect of implementing exercise training program on dialysis efficacy and physical performance of children undergoing hemodialysis.

Design: first, second and third exercise program test was conducted.

Subjects and Method: Setting: Pediatric Hemodialysis Unit at Tanta and Menoufia University Hospital: Convenience sampling Of 40 children. Four tools were used. Socio-demographic and medical clinical base line data. Instrumental activity of daily living scale such as bathing, dressing, toileting, transferring, feeding emanation. Characteristic of hemodialysis by using observation check list. Physical activity for hemodialysis children. Laboratory investigation.

Result: there were significant improvement of physical activity, daily life activity and biomedical parameters after two months exercise.

Conclusion: it can be concluded that intradialysis exercise program can enhance in urea and creatine reduction which turn lead to improvement in dialysis efficacy and physical performance of patients undergoing hemodialysis.

Recommendation: All hemodialysis children must perform intradialytic exercise program to improve their physical performance

Keywords: Exercise training, dialysis efficacy, physical performance, hemodialysis.

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I. Introduction

Continuous physical activity is an irreplaceable part of an active lifestyle not only in normal child but also in chronically ill child. Child with chronic kidney disease (CKD) and long-term dialyzed patients suffer from decreased physical efficiency these patients lose their physical fitness, which in turn results in loss of self-sufficiency and gradually also develop dependence on other persons' assistance^(1,2).

Renal failure is signed with decrease of its function which results from accumulation of metabolites in blood, the balance of fluids and electrolytes in the body gets disturbed, thereby causing serious health problems. A gradual loss of kidney function over a period of several years is termed as chronic kidney disease (CKD)^(3,4).

Hemodialysis patients experience major problems include sleep disorder, peripheral neuropathy, infection, stress, depression, anxiety, renal osteodystrophy, cognitive changes, anemia, acute pulmonary edema, pallor, scratches, discoloration and loss of strength and fragility of the skin. Self-care and self-efficacy child are the basic concepts which require attention in these groups of patients⁽⁵⁾.

Chronic renal failure is a severe clinical problem which has some significant socioeconomic impact worldwide and hemodialysis is an important way to maintain child's health state, but it seems difficult to get better in short time.

Physical activity can significantly decrease blood pressure in children's with renal failure. activity program containing warm-up, strength, aerobic exercises has benefits in blood pressure among sick people, improves their maximal oxygen consumption level, help patients in physical function, aerobic capacity and give them further benefits^(6,7).

Patients with advanced chronic kidney disease (CKD), especially those on long-term dialysis, often suffer from muscle wasting and excessive fatigue. It is known that inactivity, muscle wasting and reduced physical functioning are associated with increased mortality in CKD. Known causes include uremic myopathy and neuropathy, inactivity and anemia⁽⁸⁾

Most dialysis patients think that they cannot do exercise. The truth is most dialysis children can exercise. Most renal children describe regular exercise as the first activity that let them feel "normal" again after starting dialysis treatments. Motion even if it is only for a short time each day helps the child with chronic kidney disease feel better, stronger and more in control of their health. Medical professionals working in renal rehabilitation have shown that a continuous exercise program but also increase quality of life for children's on dialysis⁽⁹⁾.

Exercise can also help the kidney disease patient reclaim the ability to perform activities that were enjoyed prior to being diagnosed. This is not only beneficial physically but also emotionally. In dialysis patients, both aerobic and resistance exercise have demonstrable effects on physiological function⁽⁹⁾. Intradualistic aerobic exercise lead to a significant improve in aerobic exercise capacity and duration of exercise⁽¹⁰⁾ significantly improved following the use of aerobic training advanced CKD shown by increases in the peak torque of quadriceps muscle, the distance covered during a 6-min walk test, maximal walking speed, and increase performance⁽¹¹⁾.

Exercise in patients receiving continuous dialysis treatment for end-stage renal disease improve physical activity for child with advanced CKD. The mechanisms of exercise intolerance and weak health in advanced CKD patients, the methods used for measures of functional capacity, the options currently available for exercise training, and their influence on the well-being⁽¹²⁾. Exercise has been advice for the all population because of the evidence of an inverse dose response relationship between physical activity and all-cause mortality and morbidity in multiple patient populations including those with cardiovascular disease (CVD), thromboembolic stroke, hypertension, osteoporotic fractures, obesity, type 2 diabetes mellitus, colon and breast cancer, anxiety and depression⁽¹³⁾.

Aim of the study was to:

Evaluate the effect of implementing exercise training program on dialysis efficacy and physical performance of children undergoing hemodialysis

Research hypothesis:

Hemodialysis children who perform training expected to improvement in dialysis efficacy physical performance

II. Subjects and Method

Research Design:

A quasi-experimental research design was used

Setting:

The study was conducted at outpatient pediatric hemodialysis unit department Menoufia University Hospital and Tanta University Hospital .

Subjects: The sample comprised from all available 40 children attending the hemodialysis unit of Menoufia and Tanta University Hospital during the study period were recruited in the study with the following

Inclusion criteria: Age less than 18 years

Both sexes,
willing to participate in the study
Attend all exercise program.
Receiving hemodialysis 3 times per week 3-4 hours

Exclusion criteria:

Heart disease
High blood pressure
Type one diabetes
Musculoskeletal problems
Liver disease.

Tools of data collection:

Four tools were used for data collection they accomplished after reviewing the recent relevant literatures.

Tool 1:Socio-demographic and medical clinical base line data.

This tool was done by the researchers after reviewing of relevant literature for collection of baseline data regarding hemodialysis. It was comprised of two parts:

-Part (1): Socio-demographic. Sex ,age ,level of education, residence

.Part (2):years of dialysis ,past medical history primary cause of ESRD, associated disease,systolic Blood pressure ,dry weight (kg),hemodialysis hours per week ,Previous medication ,antihypertensive &anticoagulation, dialysis access, care of shunt ,number of session and duration of each session and current medication.

Part (3): characteristic of hemodialysis by using observation check list

This included the dialysis filter size ,speed of blood pump ,ideal weight and amount of fluid discard.

Tool II: Instrumental activity of daily living scale

Bathing , dressing,toileting ,transferring,feedingemanation

And vital sign(pulse ,respiration ,blood pressure andtemperature).

Tool III: Physical activity for hemodialysis children :These include running , move things ,raise things ,upclimppre ,genuflects ,walk 1000 meter ,walk 750 meter ,and change clothes alone.

- Tool IV:Laboratory investigation.

It included serum creatinine, serum bilirubin and hemoglobin before and after each dialysis session

III. Method

1-An official Permission was carried out the study from the responsible authorities.

2-Ethical and legal considerations.

-Nature of the study was not causing any harm or pain to the entire sample.

-Confidentiality and privacy was taken into consideration regarding the data collection.

3-Tools were developed by the researcher to collect data after review of literature

4- Content validity :it was tested for content validity by five experts in pediatric nursing

5- Pilot study : it was done on 10% of children to test the clarity, applicability, feasibility and the necessary modification was done Pilot study will be excluded from the to collect data study.

6-Questionnaire sheet was filled in the clinical area by the researcher after asking child or relative (Tool I).

7-Observation checklist was filled out in the clinical area by the researcher who will be available 2 days per week (tool II ,tool III and tool IV).

The .study was conducted on four phases as the following:-

1- Assessment Phase children preparation :

- In this all children were assessed by tool I part 1, 2, tool II, tool III and tool IV.

2- Planning phase:

- In this phase planning was formulated for each child based on assessment phase and literature review.

- The steps of intervention guidelines implementation were

Including:

-Setting objectives of interventions guidelines.

-preparation of the content which was covers the reasons behind the application of the session.

The general objective of exercise program is to

- Improvechildrenefficacy and physical performance of children
- Efficacy of exercise program in intra hemodialysis on children quality of life

3- Implementation phase:

-During this phase, the researcher make explaining the exercise program to the children and relatives and distributed picture, video, and booklets fill with physicalfitness steps and details of the exercise program in Arabic with pictures so the process could be easily understood by the children and relatives .

-The researcher taking baseline data using interviewing techniques daily concurrence with the two shifts of work. 8 patients were interviewed per day. The interview took between 30 and 40 minutes for each child.

-Prior to the beginning of the exercise program, to determine the children baseline health leveland fortnightly during the exercise program to determine the impact of exercise on perceived levels of efficacy and physical performance of children.

-Once the children were ready to start the program, researchers gatherhealth related efficacy and physical performance of children Life and physical suitable information before the program started.

-The exercise program total duration was forty minutes divided into 5 minutes before the session of hemodialysis and 35 minutes during the of hemodialysis session.

-Exercises contain shoulder press, bent knee and abdominal leg extension, hip abduction and drawing two times a week during each hemodialysis session.

-At the starting of the exercise program, the following variables were analyzed: creatinine, bulina and hemoglobin,

-The intervention was a program of exercise during HD sessions, 2 times per week for a period of 12 weeks. All participants submit an individualized two weekly intradialytic time for 12 weeks. shares exercise was scheduled within the first hour of dialysis in order to increase motivation and inhibit hypotension. Duration of the training was gradually prolonged, from 3-5 minutes initially to 30-40 minutes. Training intensity was also gradually improve, however, not earlier than the fulltime duration of training session was obtained.

-The program was achieved under supervisor and the advice of doctor in Rheumatology and Rehabilitation department. She help in the evaluation of physical functioning and in developing the exercises.

4-Evaluation phase:

The evaluation of the effectiveness the exercise program was done three time first month, second month and post 3 months using tool I part 2, tool II, tool III and tool IIII.

- Before and after the exercise program and dialysis session, the following variables were analyzed: creatinine, bulina and Hemoglobin to evaluate exercise program on the efficiency of dialysis

Statistical analysis:

The analysis was done using statistical software SPSS version For quantitative data, the mean and standard deviation were calculated. For qualitative data, a comparison between one group before, after and after three months exercise program intervention was done by using Chi-square test (χ^2). For comparison between means of one group before and after intervention, 1-way ANOVA test was used. A significance was adopted at $P < 0.05$ for interpretation of results of tests of significance.

IV. Results

Table (1): percentage Distribution of the studied children related to their socio-demographic data (n=40).

Characteristics	No	%
Age		
- 0<5	3	7.5
- 5<10	11	27.5
- 10<15	22	55
- >15	4	10
Mean± SD	2.675±.764	
Educational level		
- Illiterate	8	20
- primary	32.5	32.5
- secondary	47.5	47.5
total		
Residence		
- rural	21	52.5
- urban	19	47.5
Years of dialysis		
- <1	7	17.5
- 1<5	21	52.5
- 5<10	12	30
Medical history		
- Diabetes	18	45
- Hypertension	9	22.5
- Glomerulonephritis	2	5
- Polycystic	11	27.5
Associated disease		
Hypertension	22	55
Diabetes mellitus	18	45
systolic blood pressure		
-Normal	10	25
-Abnormal	30	75
Dry weight		
-10<20	12	30
-20<30	21	52.5
-30<40	4	10
-40<50	3	7.5

(mean± SD)25.60±8.69		
Previous medication		
- Antihypertensive & anticoagulation	27	67.5
- Diabetic & anticoagulation	13	32.5
Dialysis access		
- Arterial venous shunt	37	92.5
- Arterial venous fistula	3	7.5
Care of shunt		
- Waking	38	95
- Redness	2	5
Number of session per week		
- Two session	5	12.5
- Three session	35	87.5
Duration of each session		
- 4 hours	39	97.5
- 5 hours	1	2.5
Current medication		
- Medication	40	100
Activity of daily living		
Independed	24	60
Depended	16	40

Table (1): clear that distribution of the studied patients according to their socio-demographic data : Regarding the age distribution of the studied children, it was found that the more than half (55%) of studied patients aged from (10-15). Regarding the educational level, it was found that secondary school (47.5%). As regarding residence it was found that the majority (52.5%) of studied children were rural. While regarding the years of dialysis from (1-5) were (52.5%) the studied patients has diabetic in medical history were (45%). As regarding the associated disease it was found that the (55%) of studied children have and abnormal systolic blood pressure more than two third (75%) .As regarding dry weight from (20-30) it was found that (52.5%) of studied children ,dialysis access arterial venous shunt (92.5%),session dialysis per week three session (87.5%) and each session have four hours (97.5%) .As regarding daily living activity it found that more than half (60%) were independed.

Table (2): Percentage distribution of studied children related to characteristics of daily living Activity.

Bathing		
-Independed	24	60
Depended	16	40
Dressing		
-Independed	24	60
Depended	16	40
Toileting		
Independed	24	60
Depended	16	40
Transferring		
Independed	24	60
Depended	16	40
Feeding		
Independed	24	60
Depended	16	40
Elimination		
Independed	24	60
Depended	16	40
Total		
Independed	24	60
Depended	16	40

This table show that percentage of daily living activity it found that more than half (60%) were independed

Table (3):Percentage distribution of the studied children related to vital sign

Pulse		
-Normal	39	97.5
-Subnormal	1	2.5
-Above normal	0	0
(mean± SD)	1.02±.15	
Respiration		
-Normal	39	97.5
-Subnormal	1	2.5
-Above normal	0	0
(mean± SD)	1.02±.15	
Blood pressure		
-Normal	16	40
-Subnormal	0	0
-Above normal	24	60
(mean± SD)	2.20±.99	
Temperature		
-Normal	40	100
-Subnormal	0	0
-Above normal	0	0

Table (3):Shows most of studied patients are normal pulse and respiration (97.5%) and all of them(100%) are normal temperature .Regarding the blood pressure most of them (60%) above normal blood pressure .

Table(4) : percentage distribution of studied children related to laboratory investigation first, second and third months.

Laboratory investigation	laboratory measurements of the studies group						χ ²	sig	
	First month		Second month		Third month				
	N	%	N	%	N	%			
-Creatinine (CR) before dialysis	<5	10	25	26	65	12	30	1.016	0.602
	5:10	30	75	14	35	28	70		
Total		40	100	40	100	40	100		
(mean± SD)		1.40±.49		1.65±.48		1.22±.42			
-Creatinine(CR) after dialysis	<5	14	35	40	100	38	95	4.068	0.131
	5:10	26	65	0	0	2	5		
Total		40	100	40	100	40	100		
(mean± SD)		1.00±.12		1.65±.48		1.05±.22			
Hemoglobine	8:12	37	92.5	38.6	96.5	31	77.5	6.954	0.031
	>12	3	7.5	1.4	3.5	9	22.5		
Total		40	100	40	100	40	100		
(mean± SD)		1.15±.35		1.02±.22		1.22±.42			
BUN before dialysis									
	5:25	1	2.5	1	2.5	0	0	-----	-----
	>25	39	97.5	39	97.5	40	100		
		1.55±50		1.97±.15		2.00±.00			
BUN after dialysis									
	5:25	36	90	35	90	35	87.5	0.173	0.917
	>25	4	10	5	10	5	12.5		
(mean± SD)		1.10±31		1.10±.303		1.12±3.33			

Table (4): display comparison of laboratory investigations among studied sample with hemodialysis first ,second and third months post training program intervention. Regarding thelaboratory investigation of Creatinine, hemoglobin and serum bulinait was found that increase of normal range of Creatinine serum (less than 5)in studied group before exercise intervention first month (25%),second month(65%),third month (30%)it improve tofirst months (35%),second month(100%) and third month (95%) respectively.

Table (5) : Relation between laboratory investigations among studied children with hemodialysis first and third months after exercise program .

Laboratory investigation			First month N=40	Third months N=40		χ ²	sig
	N	%	N	%			
Creatinine (CR)	>5	10	25	38	95	40.833	.000
	5:10	30	75	2	5		
Bulina (BUN)	5:25	1	2.5	35	87.5	58.38	.000
	>25	39	97.5	5	12.5		
Hemoglobine	8:12	3	7.5	31	77.5	3.529	.057
	>12	40	100	9	22.5		

Table (5): display comparison of laboratory investigations among studied sample with hemodialysis first and third months post exercise intervention. Regarding the laboratory investigation of ,serum creatinine, bulina and hemoglobin studied patients first month and third months from exercise intervention, there were significant differences and improvement in laboratory investigations where P value =.000 for serum creatinine and bulina and P value =.057 for hemoglobin.

Table (6) : Percentage distribution of studied children related to first , second and third months of exercise intervention.

Characteristics Dialysis	First month		Second month		Third month		Total		χ ²	Sig
	N0	%	N0	%	N0	%	N0	%		
Filter size	4	17	42.5	17	42.5	17	42.5	42.5	.016	.899
	5	15	37.5	16	40	16	40	39.5		
	6	7	17.5	6	15	6	15	15.8		
	8	1	2.5	1	2.5	1	2.5	2.5		
Total	40	100	40	100	40	100	120	100		
M ±SD	4.82±90		4.80±.88		4.80±.88					
Speed of blood in machine										
0:50	2	5	2	5	2	5	6	5	.000	1.000
50:100	15	37.5	15	37.5	15	37.5	45	37.5		
100:150	18	45	18	45	18	45	54	45		
150:200	5	12.5	5	12.5	5	12.5	15	12.5		
Total	40	100	40	100	40	100	120	100		
M ±SD	117.37±40.39		116.3±37.82		116.37±37.82					
Fluid amount discard										
0:500	8	20	14	35	14	35	36	30	3.356	.067
500:1000	12	3	9	22.5	9	22.5	30	25		
1000:1500	3	7.5	5	12.5	7	17.5	15	12.5		
1500:2000	9	22.5	8	20	6	15	23	19.2		
2000:2500	3	7.5	3	7.5	4	10	10	8.3		
2500:3000	5	12.5	1	2.5	0	0	6	5		
Total	40	100	40	100	40	100	120	100		
M ±SD	1200.06±866.07		992.50±711.58		947.50±560.67					
ideal weight according age										
10:20	2	5	4	10	1	2.5	7	5.8	.928	.335
20:30	13	32.5	10	25	16	40	39	32.5		
30:40	7	17.5	10	25	10	25	27	22.5		
40:50	7	17.5	5	12.5	7	17.5	19	15.8		
50:60	11	27.5	11	27.5	6	15	28	23.3		
Total	40	100	40	100	40	100	120	100		
M ±SD	38.51±13.86		37.13.9±13.9		37.42±13.97					
Dialysis access										
Venous graft	37	92.5	37	92.5	37	92.5	37	92.5	0.00	1.00
Venous fistula	3	7.5	3	7.5	3	7.5	3	7.5		
M ±SD	1.07±.266									

Table (6): Represents characteristics of dialysis among studied sample first ,second and third months of exercise intervention. The results found that the arterial venous graft represent the most(92.5%) of the patients have an arterial venous graft. The filter size (4) of dialysis it was found that (42.5%) of the studied patients . Regarding speed of blood infusion in machine from (0:500) it was found (30%) . There were significant differences and improvement in studied patients in venous arterial graft , speed of infusion in machine characteristics P value = (0. 00*) and in filter size p value =(0.016).

Table (7) : Percentage distribution of studied children related to daily living exercise first , second and third months of exercise intervention.

daily living exercise	Group						χ^2	P
	First month		Second month		Third months			
	No	%	No	%	No	%		
Run								
Not limit	0	40	1	2.5	0	0	39.835	.000
Little limit	26	65	31	77.5	24	60		
More limit	14	35	8	20	16	40		
Move								
Not limit	0	40	1	2.5	0	0	5.700	.22
Little limit	26	65	31	77.5	24	60		
More limit	14	35	8	20	16	40		
Raise								
Not limit	0	0	19	47.5	5	12.5	42.693	.000
Little limit	26	65	21	52.5	18	45		
More limit	14	35	0	0	17	42.5		
Upclimppre								
Not limit	0	0	27	67.5	2	5	65.28	.000
Little limit	26	65	13	32.5	25	62.5		
More limit	14	35.5	0	0	13	32.5		
Genuflects								
Not limit	1	2.5	14	35	2	2.5	28.468	.000
Little limit	26	65	25	62.5	27	67.5		
More limit	13	35.5	1	2.5	11	27.5		
Walk 1000								
Not limit	1	2.5	1	2.5	8	20	12.883	.012
Little limit	24	60	29	72.5	19	47.5		
More limit	15	7.5	10	25	13	32.5		
Walk 750								
Not limit	1	2.5	19	47.5	6	15	26.538	.000
Little limit	24	60	16	40	22	55		
More limit	15	37.5	5	12.5	12	30		
Change								
Not limit	1	2.5	13	32.5	6	15	21.73	.000
Little limit	22	55	21	52.5	13	32.5		
More limit	17	42.5	6	15	21	52.5		

Table (7): display comparison of some daily living exercise for child among studied patient's first, second and third months exercise intervention. It was found that, there were significant differences and improvement of studied children's of all daily living exercise where P value = (0. 00*) except movewhere P= 0.22 and walk p value =.012 .

Table (8) : Percentage distribution of studied children's' exercise program intervention first, second and third months.

Exercise program item	Group			χ^2	P
	First month	Second month	Third Month		
	%	%	%		
Shoulder press					
High	0	65	40	86.689	.000
Moderate	0	30	37.5		
Low	100	5	22.5		
Knee bent					
High	0	65	40	90.571	.000
Moderate	0	35	35		
Low	100	0	25		
Abdominalleg extension					
High	0	55	35	78.978	.000
Moderate	0	40	35		
Low	100	5	30		
Hipabduction					
High	0	60	35	79.138	.000
Moderate done	0	30	40		
Low	100	10	25		
Drawing					
High	0	72.5	40	90.619	.000
Moderate	0	27.5	32.5		
Low	100	-	27.5		

Table (8) Percentage distribution of children's' exercise program intervention first, second and third month to ward child under hemodialysis. It was observed that , there is highly significant improvement difference between first month, 2months and third months post program implementation where P value=.000 , in relation to shoulder press , knee bent, abdominal leg extension, hip abduction and drawing

V. Discussion

Physical activity exercise program is suggested to achieve in making child ' life quality better, the activity is usually done mainly twice per week, and the participation time is about 40 minutes. The period ranges from 1 month to 3 months. The items of the exercise contain shoulder press ,bent knee , abdominal leg extension ,hip abduction and drawing all of them done two times a week during each hemodialysis session.

The studies about the necessity of physical activity showed that renal failure children have seriously reduced physical capacity and they have a high risk of cardiac and vascular diseases.

The results in this study clears that physical activity have benefits in blood pressure among sick people and increase their maximal oxygen consumption. These can help children physical function and aerobic capacity and may give them further benefits. These findings are in accord with the conclusion reported by **Adams (2005)**⁽¹⁴⁾ who noted that exercise restores some level of physical performance and quality of life, which can be beneficial in children with renal failure.

Exercise is important for children on dialysis because it improve lifestyle, exercise can help children if overweight suggests that should lose extra pounds, exercise along with a lower calorie, kidney-friendly diet, can also strengthen muscles with exercise. One of the most important muscles to exercise is heart. A healthy heart is important, Exercise can also reduce depression and help person feel happier.**Song et al., (2012)**⁽¹⁵⁾ who found that training of exercise during dialysis treatments may improve solute removal by increasing blood flow to muscle and efflux of urea and other toxins into the vascular compartment where they can be removed. According to **Bennett (2012)**⁽¹⁶⁾ who reported the concept of dialysis exercise adequacy and emphasized that increasing the exercise and activity of the dialysis children can decrease mortality, improve quality of life, improve physical function and decrease depression .In this study found that significant improve in physical activity and biomedical parameters after two months exercise**Ronaldo (2013)**⁽¹⁷⁾.

After exercise also **Kutner (2012)**⁽¹⁸⁾extract that, the evidence from other studies that exercise training for end stage renal disease, helps the improvement in arterial stiffness, low in pulse pressure, improve aerobic capacity, reduced need for antihypertensive medications, increase in concentration of hemoglobin and improve hematocrit levels and improved lipid metabolism. Also study done by **Kohk et al., (2009)**⁽¹⁹⁾**who mentioned that children undergoing** 12 weeks of intradialytic training, statistically significant improvements in muscle strength of the quadriceps and biceps were observed, improving physical function and vitality this study was in agreement with **Parson et al,(2006)**⁽²⁰⁾ **who mentioned** that exercises during dialysis enhanced dialysate urea removal but not serum urea clearance. Alterations in the timing of exercise during dialysis and modality may be required to elicit increases in serum urea clearance. **Parsons (2004)**⁽²¹⁾**who recommended** that mild exercise during dialysis should be performed during the first two hours of dialysis .

Renal failure is characterized with the loss of its function and results in the accumulation of metabolites in blood. As a result, the balance of fluids and electrolytes in the body gets disturbed, thereby causing serious health problems this agreement with **Kucur(2016)**⁽²²⁾who mentioned that a gradual loss of kidney function over a period of several years is termed as chronic kidney disease (CKD) or chronic kidney failure. Also**Defilippo (2009)**⁽²³⁾ **who** found that Symptoms are usually very mild and could go unnoticed for a long time and the symptoms are noticed when it is too late , in a majority of cases very little can be done to reverse the situation.

In the present study it was found that there is highly significant improvement difference between first month, 2months and three months post program implementation performance in relation to shoulder press, knee bent, abdominal leg extension, hip abduction and drawing which also found increase physical body function also **Adams et al(2006)**⁽¹⁴⁾ **and Song,(2012)**⁽¹⁵⁾ **who mentioned** that the physical activity improved physical capacity and further helping in the control of chronic diseases, including chronic kidney disease. It is displayed that physical fitness level of hemodialysis patients tends to increase their function levels; physical activity is an important nursing intervention for children with hemodialysis in improving their physical performances.

VI. Conclusion

It can be concluded that intradialysis exercise program can enhance in urea and creatinine reduction which turn lead to improvement in dialysis efficacy and physical performance of patients undergoing hemodialysis.

VII. Recommendations

- 1-Exercise programs for hemodialysis children ESRD patients are still not a part of routine clinical practice in many centers so it should done routinely per week to improve daily living function and paramedical laboratory.
- 2- Encourage nurses and health staff to participate in training exercise program and provide patient with knowledge and practice are needed about exercise.

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