INTRODUCTION

Chronic renal failure represents a significant health problem worldwide, resulting in the death of thousands and financial crisis for patients and their families ***(Christensen & Kockrow, 2003; El-Setouhy, 2003).***

Currently in Egypt, there are more than 300 active hemodialysis centers with more than 2000 hemodialysis machines, and more than 10,000 hemodialysis patients. Peritoneal dialysis has not expanded as expected, so there are only 3 continuous ambulatory peritoneal dialysis (CAPD) centers in the country with very few patients on CAPD and less than 100 patients on intermittent peritoneal dialysis (IPD). This is due to abundance and wide availability of hemodialysis in this country. Hemodialysis patients in Egypt receive an average of 10 hours of dialysis time / patient / week and the arteriovenous fistula is the most common vascular access for treatment. However, less than 10% of them are on bicarbonate dialysate and approximately 10% are on erythropoietin therapy for their anemia ***(Afifi & Karim, 2006).***

In Egypt, most of patients 99.9% with end stage renal disease (ESRD) are treated by hemodialysis, while only 0.1% of patients with ESRD are treated by peritoneal dialysis .The number of patients with ESRD on regular hemodialysis increases by 10% every year. In the year 2004, it was 33000, while it became 39600 patients at the end of year 2006 ***(Afifi & Karim, 2006).***

Many dialysis centers in Egypt in many governorates are providing regular dialysis treatment to thousands of patients with ESRD ***(Sharafe, 2000).***The application of hemodialysis for patients with ESRD is usually associated with complications, which arise during long-term hemodialysis as anemia, bone disease and peripheral neuropathy. There are also complications encountered during hemodialysis setting as; hypotension, chest pain, dyspnea, nausea and vomiting and bleeding ; also vascular complications as inflammation and occlusion of fistula ***(Lewis et al., 2000; Ignativicues & Workman, 2002; Ethier et al., 2008 Maya & Allon,2008).***

Hemodialysis is the most common method used to treat advanced and permanent kidney failure. Since the 1960s, when hemodialysis first became a practical treatment for kidney failure, doctors learned much about how to make hemodialysis treatments more effective and minimize side effects. However, even with better procedures and equipment, hemodialysis is still a complicated and inconvenient therapy that requires a coordinated effort from the whole health care team, including the nephrologist, dialysis nurse, dialysis technician, dietitian, and social worker. However, the most important members of the health care team are the patient and their family ***(Headly & Wall, 2005).***

Hemodialysis started earlier than peritoneal dialysis in Egypt. It replaces some but not all of the kidney's functions. The first hemodialysis was done in Ain Shams University Hospital in 1958, while the first IPD was performed at Cairo

University HospitalS in 1963. When CAPD started to become popular, the doctors of Al-Salam Hospital in Cairo introduced this procedure in 1982, as a method for renal replacement therapy ***(Afifi & Karim, 2006).***

End stage renal disease is not only a clinical concern, but also, a growing economic problem. Recently, ESRD has received increased attention as a public health problem, this is due to the out increasing numbers of patients attending ESRD therapy ***(Farage, 2005; and Abd El-Azeem, 2008).***

Self-care is about having control of ones own care. For the purposes of health, it is about the person being able to decide how and what action needed to be taken and by whom, in order to sustain their care/treatment .Self-care is about the choice a person makes and actions they taken to maintain health and well being ***(Department of Health, 2003; Linda &Barbara, 2009).***

Self-care can be given in a number of ways, by the patients and their families, friends, formal and informal care and relation to community groups. Self-care is about the individual being activity involved in finding effective ways to deal with their identified problems and enable them to achieve their goals ***(Linda & Barbara, 2009).***

Benefits of self-care include lower costs for the health care system; more effective working relationships between patients, physicians and other health care providers; increased patient satisfaction; and improved perceptions of one's health

condition. Self-help behaviors have been shown to lessen pain and depression and to improve quality of life. Self-care now is concerned with development and use of personal health practices and coping skills, making decisions involving consulting others, and using one's own resources to manage health problems ***(http://www.answers.com/topic/selcare,2010).***

Perception in humans describes the process where by sensory stimulation is translated into organized experience. This experience, or percept, is the joint product of the stimulation and of the process itself. Because the perceptual process is not itself public or directly observable (except to the perceiver himself, whose percepts are given directly in experience), the validity of perceptual theories can be checked only indirectly ***(Allan et al., 2000).***

Significance of the study:

It is obvious that the problem of renal failure is increasing rapidly. Patients with chronic renal failure usually do not require permanent hospitalization, but they are in need to adhere to therapeutic regimen for the rest of their lives.

The estimated number of patients with ESRD in Egypt was about 18.000 at year 2000 and 28.212 at the end of 2003. Estimated prevalence per million of dialysis patients in Egypt was 255 in 1996, while became 264 in 1998, /314 in 2000, /375 in 2001 and 403 in 2003 ***(Farage, 2005).***

The mortality of hemodialysis patients in Egypt is approximately 25-30% annually. Ischemic heart disease and infections are the leading causes of death amongst these patients. There is an apparent increase in the number of patients with chronic renal failure. The prevalence rate of ESRD in Egypt during 2004 was 483 per million populations; while in 2006 was 604 patient per million population ***(Afifi and Karim, 2006).***

End stage renal disease is a life treating disease. In Egypt, it is considered as a national problem because it has several effects on the patients. Such as economic, social and psychological aspects and consequently on the population ***(Afifi and Karim, 2006).***

AIM OF THE STUDY

The aim of this study was to assess self-care management in hemodialysis patient through:

- Assessing client's knowledge and attitude regarding to self-care management.
- Assessing client's perception about self-care management.
- Assessing client practice regarding to self-care management.

Research questions:

- Is there a relation between socio economic standards of the client and self-care management?
- Is there a relation between self-care management and level of education?
- Is there a relation between level of education and perception and practice of self-care?

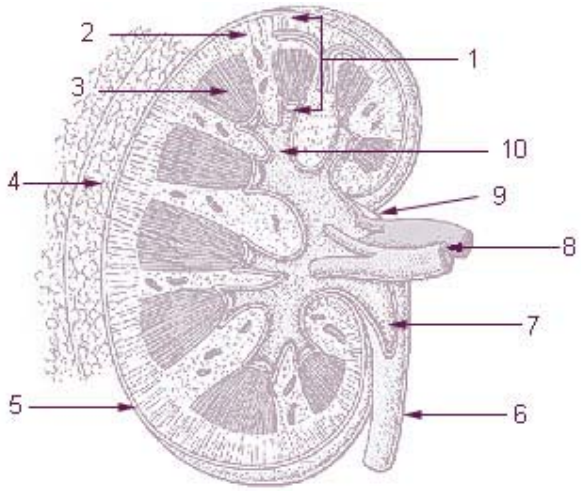
Part I
Renal Failure

Introduction about the Kidney

The kidney is one of a pair organ, lying on the posterior abdominal wall between the 12th thoracic and third lumbar vertebra, the right kidney is slightly lower than the left. Each kidney measures 11cm in the vertical axis and weighs 135 to 150 gm ***(Walash, 2002)***.

The kidneys are important excretory organs, functioning along with the lungs in excreting the waste products of food metabolism. Carbon dioxide and water are the products of carbohydrates and fat metabolism. Protein metabolism produces urea, as well as various acids, which only kidneys can excrete ***(Linton & Maebius, 2003; Lewis et al., 2005)*.**

The kidneys have three important functions, which are**,** fluid and electrolyte balance, excretion of waste products and many drugs and toxins, hormone synthesis and secretion, such as secretion of erythropoietine, which regulates red blood cells production in the bone marrow, secretion of rennin which is the key part of rinin-angiotensin-aldosterone system, and activation of vitamin D and prostaglandins ***(Wikipedia, 2008)*.**



1	Parenchyma
2	Cortex
3	Medulla
4	Perirenal fat
5	Capsule
6	Ureter
7	Pelvis of kidney
8	Renal vessels
9	Hilum
10	Calyx

Figure (1): Anatomy of the kidney *(Renal Data System, 2001; Available at: http://www.usrds. org/slides_2001.htm.5-12-2007).*

The kidney is one of the parenchymatous organs. It consists of cortex and medulla, where the process of waste excretion takes place. Cortex is the outer layer of the parenchyma consisting of *connective tissue*, *glomeruli* and *convoluted tubules* where filtration takes place. Medulla is the area of the kidney where concentration of wastes takes place; it contains Henle's loops and pyramids of converging tubules. Calyx (calyces) is the collecting area for urine within kidney before it passes to renal pelvis. Pelvis is the central collecting system of kidney. *Hilum* is the area of convergence of the renal collecting system, *ureter* delivers formed urine to the urethra, *renal artery* is the blood supply of the kidney and *renal vein* is the blood drainage. Ureteropelvic junction is the point at which the renal pelvis becomes the ureter. Capsule is the dense fibrous

tissue covering the kidney. Gerota's fascia is the layer of connective tissue between the kidney and the psoas muscle and the lumbar spine. Perinephric fat is the layer of fat surrounding the kidney outside of the capsule. Perihilar fat is the layer of fat in the area of the renal hilum (figure 1) ***(Renal Data System, 2001; Seeley et al., 2002).***

The nephron is the functional unit of the kidney. There are approximately one million nephrons per kidney. Each nephron consists of glomerulus, Glomerular capsule, approximately convoluted tubule, a loop of henle (descending and ascending limbs), a distal convoluted tube, collecting duct and accompanying vasculature(figure 2) ***(Walash, 2002; Adam & Osborme,2005).***

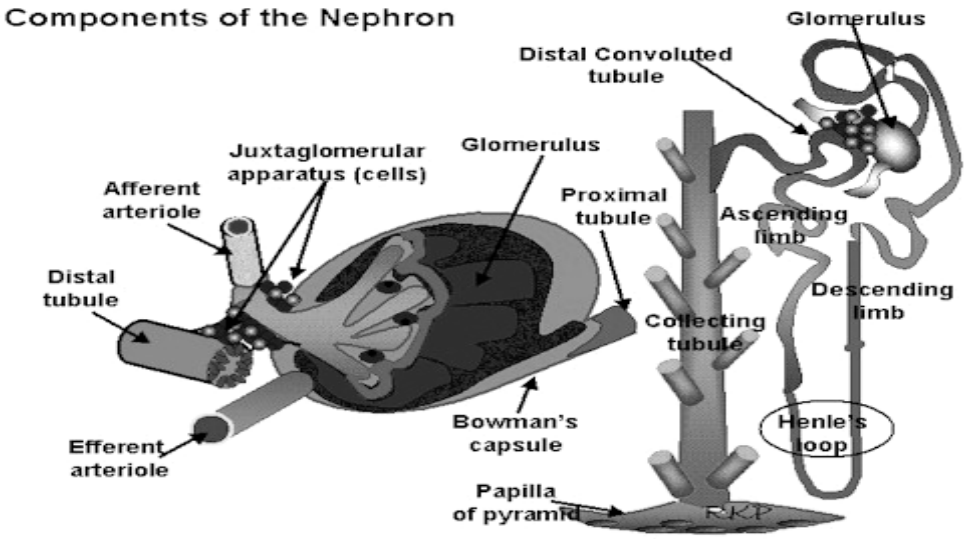


Figure (2): The nephron ***(Smeltzer & Bare, 2004; Text book of medical Surgical Nursing (10th ed.). Lippincott Williams & Wilkins: Philadelphia; p. 1215).***

Blood enters the kidney via the renal artery, which is a branch of the aorta. Each kidney receives approximately 625ml/min of blood; this constituted a total 25% of the cardiac output ***(Smeltzo and Bare, 2002; Lewis et al., 2005)***.

Glomerular filtration

Glomerular filtration, is the process by which fluids and salts are moved from the vascular system into the tubular system of the nephron, from an area of relatively high pressure to an area of low pressure. Glomerular filtration rate (GFR) is the best indicator of how well kidneys are working. The GFR is a measure of plasma volume that can be cleared of any given substance within a certain period. In a person with normal renal function, the GRF is about 180 L/day. The GRF can be used as an indicator of adequacy of renal function ***(Seeley et al., 2002; Johnson et al., 2006)*.**

Epidemiology of ESRD over the world and in Egypt

Prevalence of dialysis patients in Egypt has increased from 10/million population (PMP) in 1974, to 225/million population in 1996, then increased to 483/million in 2004. The incidence of ESRD patient is growing, the estimated number of ESRD in Egypt was 14.636 in 1998, increased to 35.751 in 2004 (figure 3) ***(Egyptian Renal Registry, 2004)*.**

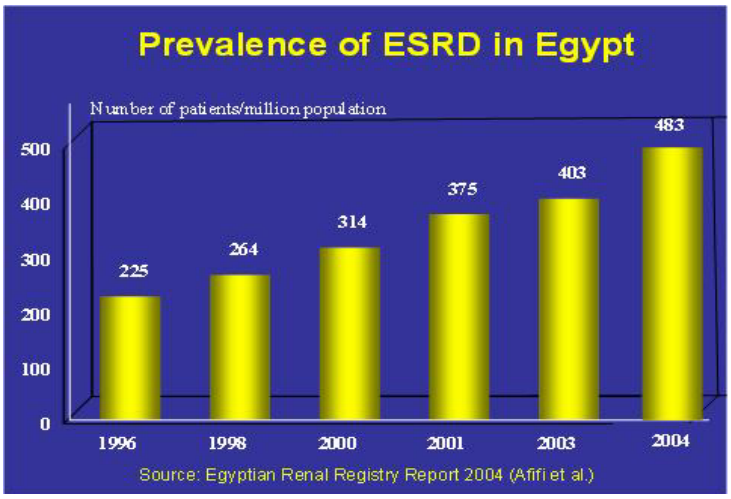


Figure (3): Prevalence of ESRD ***(Egyptian Society of Nephrology, 2004; Egyptian Renal Registry, Annual Report).***

Renal failure

Renal failure (RF) defined as a reduction in GFR, which leads to loss of the ability of the kidney to perform its function. RF can exist without symptoms for many years. Renal failure progresses so gradually that it might not be noticed until the kidneys are functioning at less than 25% of their normal capacity ***(Linton & Maebius, 2003; Adam & Osborme, 2005).***

End stage renal disease

The ESRD is total or nearly total permanent kidney failure. Patient with ESRD must undergo renal replacement therapy or transplantation to keep alive ***(Swearingen, 2003).***

In 2002, the National Kidney Foundation (NKF) published treatment guidelines that identified five stages of CKD (chronic

kidney disease), based on declining GFR measurements ***(Vanholder et al., 2003; Boure & Vanholder, 2004)*.**

Stages of CRF

As mentioned by Levy et al. (2004), Verrelli (2004) and Dauagirdas et al.(2007) the CRF passes through five stages:

Stage one, kidney may damage with normal GFR (90ml/min/1.73m^2 or above), that might occur before the GFR begins to decline. In this first stage of kidney disease, the goals of treatment are to slow the progression of CKD and reduce the risk of heart and blood vessel disease.Stage tw***o***,Kidney damages with mild decrease of GFR (60 to 89 ml/min/1.73m^2), when kidney function starts to decline, health care provider will estimate the progression of CKD and continue treatment to reduce the risk of other health problems**.**Stage three**,** moderate decreases in GFR (30 to 59 ml/min/1.73m^2),when CKD has advanced to this stage, anemia and bone problems become more common.Stage four,severe reductions of GFR (15 to 29 ml/ min/1.73m^2), continue following up the treatment for complications of CKD and teaching as much as patient can about the treatments for kidney failure .Stage five**,** kidney failure (GFR is less than 15 ml/ min/1.73m^2) occurs when the kidneys do not work well enough to maintain life, patient will need dialysis or kidney transplantation.

Pathophysiology of end stage renal disease

The ESRD is progressive distraction of nephrons leading to gradual reduction in renal functions. Electrolytes and water homeostatic disturbance may cause fluid overload, hypertension,

hyperkalemia and metabolic acidosis as well as rise in serum urea and creatinine. Initially, there maybe a phase of large volumes of dilute urine production due to reduction in tubular reabsorption, as GFR falls further urine volume falls to less than normal ***(Seely et al., 2002; Khowailed, 2005).***

Second function is excretion of waste products, drugs and toxins accumulate in serum leading to complications of toxicity ***(Seely et al., 2002; Khowailed, 2005; Levey et al., 2005).***

In addition, the hormonal function of the kidney is also affected, reduction of vitamin D activation causes hypocalcaemia and hyperparathyroidism. Reduced erythropoietin production causes anemia ***(Cunningham et al., 2004; Verrelli, 2004)***

Pathophysiologic changes in ESRD may be a result of vascular injury, glomerulosclerosis, or tubulointerstitial injury. Decreased blood flow, inflammatory changes in the glomeruli, and thickening of the capillary walls lead to a loss of selective permeability and a reduced glomerular filtration rate. As the disease progresses, more nephrons are destroyed and kidney function continues to decline ***(Alebiosu & Ayodel, 2005).***

Etiology of ESRD

There are many causes leading to ESRD as:

Diabetes mellitus (DM), is the most common cause of CRF, the high levels of sugar damage the kidneys over several years, and results in a reduced ability to filter blood and excrete

waste products in the urine ***(Black & Hawks ; 2005 and Nephrology Channel, 2006).***

High blood pressure (hypertension), is a disorder that leads to damage of small blood vessels leading to ESRD ***(Chobanian et al., 2003).***

Chronic glomerulonephritis (CGN), ESRD can result from CGN, or from kidney infections. Glomerulonephritis may cause a small output of urine, the spilling of blood and protein into the urine, and body swelling. Long-term or repeated kidney infections can also damage the structure of the kidneys, reducing the kidney's capacity to filter blood ***(Molitch et al., 2004; Nephrology Channel, 2006).***

Stones and other blockages in kidney, can lead to CRF. Obstruction in the natural flow of urine causes back- pressure in the kidney, which can damage the kidney's functional units, the nephrons. This damage can occur slowly over several years, and can ultimately lead to CRF ***(Lewis et al., 2005).***

Alport's syndrome, believed to be a form of autoimmune diseases that causes kidney failure and hearing loss. The patient's immune system sets up antibodies that act on the capillaries in the kidney ***(Schilling et al., 2002; Adam & Osborne, 2005).***

Systemic lupus erythematosus **(**SLE), an autoimmune disorder, can cause the body to produce antibodies directed against the kidney membranes. Normally, the filtering membranes do not permit albumin and other blood proteins to be lost in the urine ***(Molitch et al., 2004).***

Polycystic kidney (PCK) disease, is a condition where cysts form in the kidney. Some of the cysts do not cause any progressive kidney failure. Other cysts are of the inherited type, which may enlarge and slowly crowd out the normal kidney. Eventually, after a long period, the patient may need renal replacement therapy or transplantation. Symptoms of this disease range from no symptoms at all to blood appearing in the urine. The inherited type of this disease is autosomal dominant. This means that if one parent has the gene in his/her family there is a 50% chance that each child will develop the disorder ***(Schilling et al., 2002).***

According to the Egyptian renal registry (2001), the etiologies of ESRD) are hypertension(22.1%), DM (14.5 %), CGN (12.4%), reflux (5.6%), obstructive uropathy (5.6%), bilharziasis (3.2%), PCK (2.9%), SLE (2.4%), analgesic nephropathy (1.9%), gout (1.5%), amyloidosis (1.5%), and collagen disease (0.7%**)** (figure 4) ***(Afifi, 2001).***

Figure (4): The etiologies of ESRD ***(Egyptian Society of Nephrology, 2004; Egyptian Renal Registry, Annual Report).***