

Assessment and management of pain in hemodialysis patients: A pilot study

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ABSTRACT

Purpose: To assess pain levels of hemodialysis (HD) patients and to report pain management techniques.

Materials and methods: A quantitative descriptive study design with a summative approach to qualitative analysis was held, with a personal interview of the HD patients in a Southern European city hospital (n=70), using the Visual Analog Scales (VAS), the Wong-Baker Pain Scales (WBPS) and McGill Pain Questionnaire. People confused or in a coma, with hearing or reading problems and inability to communicate in the spoken language were excluded.

Results: Renal patients under investigation were 69.72 ± 12.45 years old, male (58.5%) and on HD for 35.5 ± 27.4 months. In the Wong Baker Scale, pain was rated as “hurts little more” 30.8%, (n=20) and in the VAS 30.8% (n=20) reported 6/10 the amount of pain experienced. Forty-six percent pinpointed

internal pain in the legs. Pain experienced was characterized as sickening (70.8%), tiring (67.7%), burning (66.2%), rhythmic (86.2%), periodic (66.2%) and continuous (61.5%). The patients studied mainly manage pain either with warm towel/cloth (85.2% females and all male patients), with massage (84.2% and 88.9%, respectively) or painkillers (47.4% and 52.6%, respectively). In a correlation of gender and pain management techniques, statistical significance was found only with warm towel (p=0.038).

Conclusions: As renal patients are an increasing group of healthcare service users, and pain is affecting their everyday life, it is essential to individualize pain evaluation and to provide further education to clinical nurses so that they can effectively manage pain.

Key words: Renal replacement therapy, pain, hemodialysis

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INTRODUCTION

Chronic Kidney Disease (CKD) is a global phenomenon with increasing incidence and prevalence, poor outcome and high cost [1]. Globally, over 2 million people require Renal Replacement Therapy (RRT) to sustain life, but this likely represents less than 10% of those who are in need of these procedures [2]. Worldwide, each year there is a 7-10% increase in renal patients due to increased prevalence of Diabetes Mellitus (DM), hypertension and cardiovascular disease. Given this increase, the prevalence of CKD is expected to dramatically increase over the next two decades [2].

Renal patients are frequent consumers of healthcare services and often experience pain either during the pre-dialysis phase of the disease or during renal replacement period [3-7]. Pain is defined as an “unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage” [8].

Epidemiology data on pain in renal patients are quite limited; however, studies have shown that 37%-50% of hemodialysis (HD) patients experience chronic pain (moderate to severe in intensity) [4, 9] and that affects their Health Related Quality of Life (HRQOL) [10].

To our knowledge, there is a shortage of clinical and research focus in the area of renal patients’ pain. According to Patients’ Rights and Maslow’s pyramid of needs, the relief of pain is a basic human right. Pain assessment and management are judged to be a priority in nursing, but often pain is undermanaged [11, 12]. It is hypothesized that renal patients experience some kind of pain during RRT, and that they take actions to manage it.

The purposes of this study are to acquaint nurses involved in the delivery of renal care a) with the level of pain as it is perceived by their patients and b) with the chosen management methods. Furthermore, it is aiming to familiarize nurses with the principles of pain assessment and management.

MATERIALS AND METHODS

Participants and data collection

The pilot study involved all HD patients (convenience sample) of a public hospital’s dialysis unit in Thessaloniki, Greece (n=70). Data were collected with face to face interviews with the patients, during the second hour of HD. It was chosen to have the interviews within the HD unit in order for the patients to feel more comfortable and familiar with the setting. The second hour of the HD session was chosen due to the fact that, usually, after the second hour complications (hypotension/vomiting)

may appear. It was decided to exclude patients with hearing or seeing problems, comatose or disorientated, minors or unable to communicate in the native language (n=5).

Research instruments

The Wong-Baker FACES Pain Rating Scale (WBPS) [13] was used in order to measure pain. This scale consists of six figures ranging from no pain (smiley face) to extreme pain (crying face) and it was initially used with children. During the interview the patient identified the face representing his/her present pain condition.

Secondly, a Visual Analogue Scale (VAS) [14], ranging from none to extreme pain, was presented by the interviewer in order to measure the amount of pain felt at the moment of the interview. Operationally a VAS is a horizontal line, 100mm in length, anchored by word description at each end (no pain on the left hand end and very severe pain on the right hand end). Renal patients were asked to mark on the line the point that represented their current perception of pain. The VAS score is determined by measuring in millimeters from the left hand end of the line to the point that the patient marks.

Finally, the McGill Pain Questionnaire (short form) [15] was used in order to assess the patients’ pain experience over the last week. It consists of 24 questions describing pain. The questionnaire has already been translated and validated into the native language [16].

The interviews were anonymous and only the patients’ initials, gender, and date of interview were recorded by the researcher. During the interviews it was decided not to use a tape recorder. Instead, answers were filled in a printed version of the questionnaires as patients were more familiar to that kind of data collection. Approval of the ethics committee of the hospital was obtained, as well as written informed consent from the participants.

Statistical analysis

Data were analysed using SPSS Version 20.0. For data analysis, descriptive statistics were used (frequencies), as well as crosstabs, Chi-square test, correlations and *t*-test.

RESULTS

Mean age of renal patients studied was 69.72 ±12.45 years old, male (58.5%, n=38) and on HD for 35.5 ±27.4 months (Table 1). In the WBPS, they choose the face that corresponded to “hurts little more” or number four (31%, n=20) and in the VAS 31% (n=20) of the patients marked 6cm as the point

representing the amount of pain experienced at the moment. The in gender analysis for both pain scales is shown in Table 2.

Table 1. Patients' characteristics.

Age	69.72 (±12.45) years old 27-91 years old
Gender	Male = 58.5% (n=38) Female = 41.5% (n=27)
Duration of HD	35.49 ±27.4 months

HD-hemodialysis

In the body diagram, included in the McGill Questionnaire, pain of internal origin was marked in the legs (46%, n=29). In a comparison between genders eighteen (50%) of the male patients pointed legs as the place of internal pain, whereas thirteen (48%) of the female patients experience internal pain in the arms. Pain of external force was pointed at fistula site by 71% (31 male and 15 female) and was attributed to needling. There was no statistical significant correlations between gender and pain of internal origin (p=0.185), whereas it was correlated with pain of external force/needling (p=0.027).

Pain, as described by the patients, after choosing the word most suitable for them in the McGill questionnaire is presented in Table 3. When

asked about the type of pain they described it as continuous (61.5%, n=40), constant (61.5%, n=40), periodic (66%, n=43), rhythmic (86%, n=56) and steady (51%, n=33). They thought that their pain at the moment of the interview was distressing (41.5%, n=27) and discomforting (32%, n=21). In a gender comparison of pain level at the moment of the interview males described it as discomforting and distressing (n=14). Females used the same description on a reverse order (Figure 1).

After the first five interviews, it was found that the chosen questionnaire did not assess the ways of managing pain. It was, then, decided by the research team to add an open-ended question regarding the mater

According to the sample, pain was treated either with warm towel/cloth (all males and 85% in the female group), massage (84% and 89%, respectively) or going for a walk. In a correlation of gender and ways of managing pain (painkillers, massage, yoga, warm towel/cloth, workout, walk, nothing) statistical significance was found only with warm towel (p=0.038) (Figure 2).

Furthermore, statistical significance was found between age and some management techniques such as warm towel (p=0.013) and workout (p=0.019).

Table 2. In gender pain analysis in Wong Baker Scales and Visual Analogue Scale.

Wong Baker Scales											
	Does not hurt (0)	Hurts a little bit (2)	Hurts little more (4)	Hurts even more (6)	Hurts whole lot (8)	Hurts worst (10)					
Male	2.6% (n=1)	18.4% (n=7)	31.6% (n=12)	26.3% (n=10)	21.05% (n=8)	0					
Female	0	11.2% (n=3)	29.6% (n=8)	33.3% (n=9)	25.9% (n=7)	0					
Visual Analogue Scales											
	0 cm	1	2	3	4	5	6	7	8	9	10 cm
Male	0	0	15.8% (n=6)	5.3% (n=2)	2.6% (n=1)	13.2% (n=5)	42.1% (n=16)	10.5% (n=4)	7.9% (n=3)	2.6% (n=1)	0
Female	0	0	3.7% (n=1)	7.4% (n=2)	14.8% (n=4)	7.4% (n=2)	14.8% (n=4)	29.6% (n=8)	14.8% (n=4)	7.4% (n=2)	0

Table 3. Pain described in McGill questionnaire.

		Valid percent
1	Flickering, quivering, throbbing, beating	20% (n=13)
2	Flashing	64.6% (n=42)
3	Boring	53.8% (n=35)
4	Sharp	50.8% (n=33)
5	Gnawing	41.5% (n=27)
6	Pulling	53.8% (n=35)
7	Burning	66.2% (n=43)
8	Smarting	38.5% (n=25)
9	Dull	30.8% (n=20)
10	Rasping	47.7% (n=31)
11	Tiring	67.7% (n=44)
12	Sickening	70.8% (n=46)
13	Fearful	44.6% (n=29)
14	Grueling	52.3% (n=34)
15	Wretched	75.4% (n=49)
16	Miserable	43.1% (n=28)
17	Penetrating	42.2% (n=27)
18	Drawing, numb	2.2% (n=17)
19	Cold	70.8% (n=46)
20	Agonizing	43.1% (n=28)

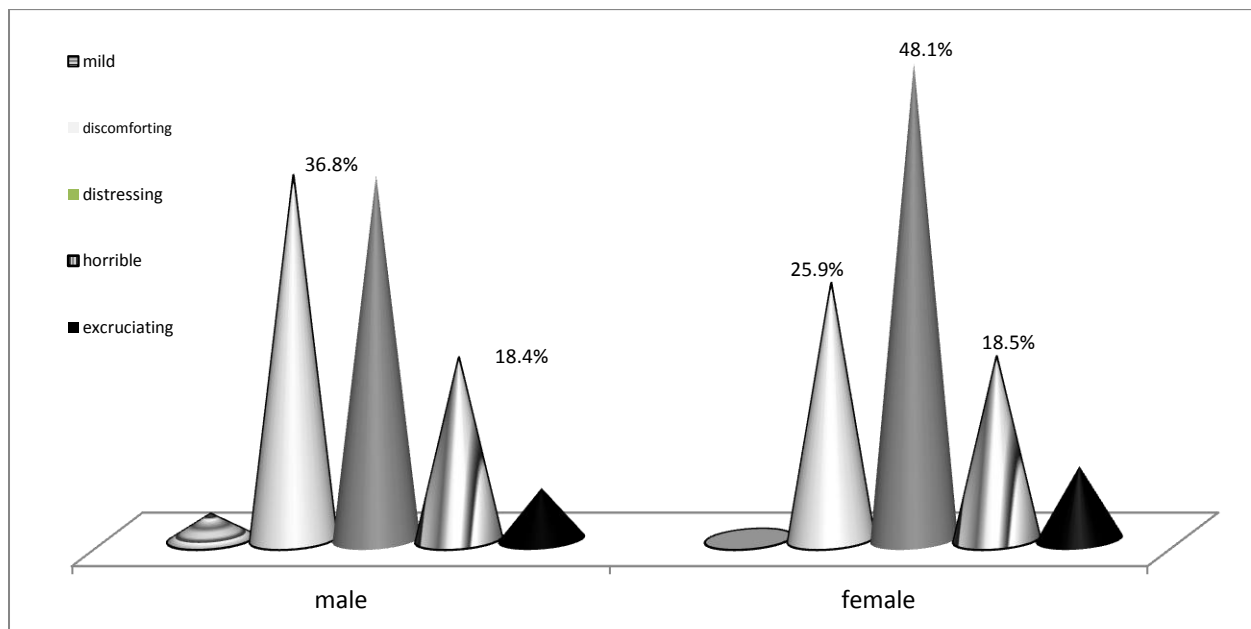


Figure 1. Comparison of pain at the moment of interview between male and female patients.

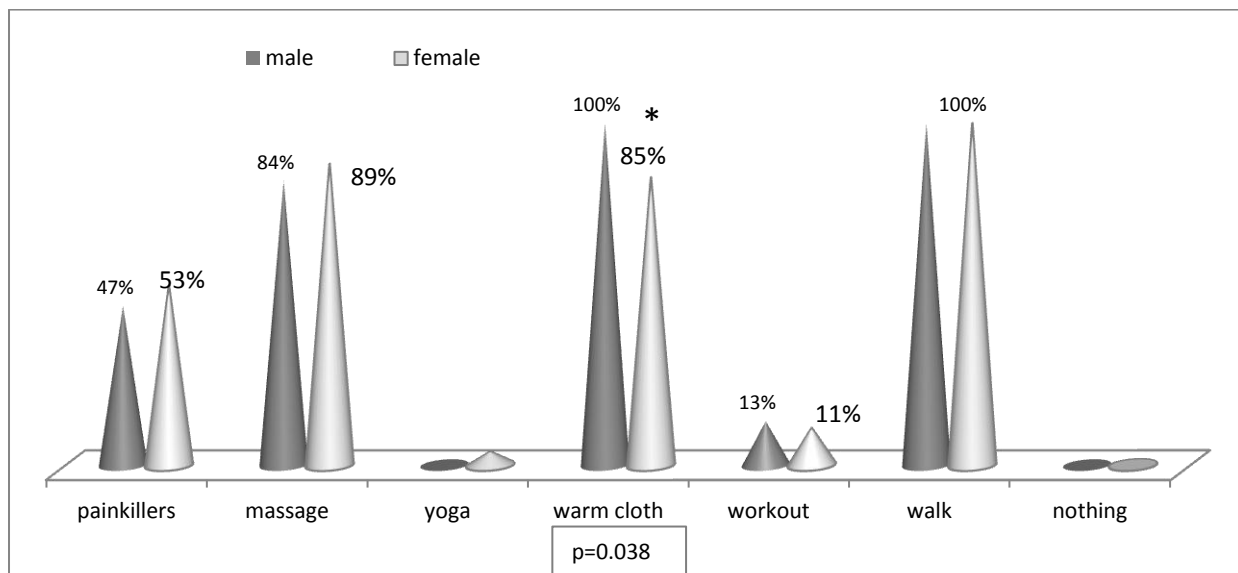


Figure 2. Management of pain according to gender.

DISCUSSION

Both scales (WBPS and VAS) used in the research showed that more than one third of our sample rated pain as 6/10 and pinpointed internal pain in the legs. Pain experienced was characterized as wretched, sickening, cold, tiring, burning and flashing (varying from 31-75%). Moreover, the type of pain was described as rhythmic, periodic and continuous.

Multiple factors can cause pain in renal patients. HD sustains life, but it cannot stop underlying systemic diseases and their painful symptoms such as ischemic limbs or neuropathies [6, 17].

Furthermore, there are numerous painful syndromes unique to CKD such as calciphylaxis [17], renal osteodystrophy [18] and amyloidosis [19]. Recurrent pain caused by an average of 320 arterio-venous fistula punctures per year [20], muscle cramps and headaches during dialysis [21] is perceived, by some patients, as chronic pain [17,22]. Half of the sample population reported that pain caused by external force is targeted at the vascular access site. Musculoskeletal (bone and joint) pain is the most common of the chronic pain in CKD, as in general population [23]. Acute pain can be caused from various surgical procedures such as creation of vascular access and insertion of HD catheter. Quality of life studies in renal patients have shown high scores for bodily pain compared to general population, leading to reduced employment rates and physical functioning [24, 25].

Sample's pain varied from mild to excruciating, and it was always present in their daily routine. Females had more discomforting feeling of pain compared to male patients (35.7% compared to 14.3%). Research suggests that women experience a greater, and more intense, number of symptoms [10, 23].

Patients usually manage pain either with warm towel/cloth (85% of females and all male patients), massage (89% and 84%, respectively) or painkillers (53% and 47%, respectively). Painkillers ranged from plain paracetamol to combinations of paracetamol with codeine phosphate and caffeine. Despite the availability of effective pain management interventions [1] and guidelines for the management of pain in other patient groups [12], many renal patients continue to receive inadequate analgesia [6, 26]. Although medication has an important effect on the well-being of HD patients, the Kidney Disease Outcomes Quality Initiative (K/DOQI) guidelines have not addressed the use of pain management [27]. Renal medical and nursing community is asked to refer to National Kidney Foundation proposals that discourage the prescription of NSAID in patients with CKD who are not yet on dialysis [27,28] and the World Health Organization (WHO) suggestions of limited use of these agents in CKD patients [5,26,27]. The response to pain therapy depends more on patient-related factors such as physical, emotional, social, spiritual and financial rather than the potency

of analgesics. These psychosocial and spiritual factors interact with physical symptoms and suffering of the patient and need to be addressed in pain management [29]. Pain in CKD patients is inadequately managed as analgesic use has decreased over the last few years [6]. Morphine was the analgesic of choice for treatment of severe acute and chronic pain syndromes during the last decade. Several authors [6,30,31] have confirmed the variability in the kinetics of morphine and its metabolites in the presence of renal impairment. According to them, renal patients are at greater risk of developing opiate toxicity with prolonged effects and severe respiratory depression [1].

A variety of management methods (non-pharmacologic and non-invasive) can be used, as our sample suggests. These techniques are more time-consuming for patient and nurse, but they place patient in a more active role.

Reinforce or modify pain control behaviors by observing patients to see what they do to reduce or control pain. Such observation may provide important information for tailoring nursing interventions to a specific patient. Patients often use techniques of positioning, rubbing and splinting to decrease or limit pain. Massage of a painful limb, either by the patient himself or by the nurse, can decrease muscle tension and can break the cycle of tension, increased pain, and increased tension. In addition, it can help bring about mental and physical relaxation and strengthens the nurse-patient relationship [32].

Heat application causes vasodilatation resulting in increased blood flow and reduced pain levels. Nurses can apply heat through the use of warm blankets or electric heating pads, and by assisting the patient to shower or bathe before or after HD session [33, 34].

Walk or mild exercise programs have been shown to reduce fatigue. Some patients report an improvement in comfort and gradually reduce of pain when joints are kept active, even during HD sessions [35, 36].

Study limitations. The main limitation of this study was that the McGill questionnaire used did not have a section of recording pain management methods. It was realised after the first five interviews so it was decided, by the research group, to add this part as an open question, to exclude the first five interviews and to have a qualitative analysis of that part of the questionnaire. Another limitation was the number of participants, and the fact that the pilot study evolved only one hospital in the region.

CONCLUSIONS

As renal patients are an increasing group of healthcare service users, and pain is affecting their everyday life, it is essential to individualize pain evaluation. Pain assessment is a critical component of nursing process. It is mandatory to provide further education to clinical nurses in order to effectively manage pain. A detailed nursing history should be obtained focusing on pain location, duration, associated symptoms and relieving factors. This way nurses, not only renal nurse, can better understand each dimension of pain, assess it and take nursing decisions for its management [32].

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Conflicts of interests

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REFERENCES

1. Williams A, Manias E. A structured literature review of pain assessment and management of patients with chronic kidney disease. *J Clin Nurs.* 2008 Jan;17(1): 69-81.
2. Eggers PW. Has the incidence of end-stage renal disease in the USA and other countries stabilized? *Curr Opin Nephrol Hypertens.* 2011 May; 20(3):241-5.
3. Chalmers C. Applied anatomy and physiology and the renal disease process. In: Thomas N (ed), 2008. *Renal Nursing.* London: Elsevier Health Sciences; p. 27-74.
4. Pham PC, Dewar K, Hashmi S, Toscano E, Pham PM, Pham PA, Pham PT. Pain prevalence in patients with chronic kidney disease. *Clin Nephrol.* 2010 Apr;73(4):294-9.
5. Kafkia T, Chamney M, Drinkwater A, Pegoraro M, Sedgewick J. Pain in Chronic Kidney Disease: prevalence, cause and management. *J Ren Care.* 2011 Jun;37(2):114-22.
6. Bailie G, Mason N, Bragg-Gresham J, Gillespie B, Young E. Analgesic prescription patterns among haemodialysis patients in the DOPPS: Potential for underprescription. *Kidney Int.* 2004 Jun; 65(6): 2419-25.
7. Mercadante S, Ferrantelli A, Tortorici C, Lo Cascio A, Lo Cicero M, Cutaia I, Parrino I, Casuccio A. Incidence of chronic pain in patients

- with end-stage renal disease on dialysis. *J Pain Symptom Manage*. 2005 Oct;30(4):302-4.
8. Merskey H, Bogduk N. Classification of chronic pain, IASP task force on taxonomy. 2nd ed. Seattle, WA: IASP Press; 2011. Part III: Pain Terms, A Current List with Definitions and Notes on Usage; p. 209-14.
 9. Noble H, Kelly D, Rawlings-Anderson K, Meyer J. A concept analysis of renal supportive care: the changing world of nephrology. *J Adv Nurs*. 2007 Sep;59(6):644-53.
 10. Finkelstein FO, West W, Gobin J, Finkelstein SH, Wuerth D. Spirituality, quality of life and the dialysis patient. *Nephrol Dial Transplant*. 2007 Sep;22(9):2432-4.
 11. Polkki T, Pietila A, Vehnilainen-Julkunen K, Laukkala H, Kiviluoma K: Imagery-induced relaxation in children's postoperative pain relief: a randomized pilot study. *J Pediatr Nurs*. 2008 Jul; 23(3):217-24.
 12. Bromley L. Renal Dysfunction. In: Cox F (ed), 2009. Perioperative pain management. London: Blackwell Publishing; p. 221-2.
 13. Wong DL, Baker C. Reference manual for the Wong-Baker faces pain rating scale. Duarte: Mayday Pain Resource Center; 1995.
 14. Aitken R. Measurement of feelings using visual analogue scales. *Proc R Soc Med*. 1969 Oct; 62(10):989-93.
 15. Melzack R. The short-form McGill Pain Questionnaire. *Pain* 1987 Aug; 30(2):191-7.
 16. Mystakidou K, Parpa E, Tsilika E, Kalaidopoulou O, Georgaki S, Galanos A, Vlahos L. Greek McGill Pain Questionnaire: validation and Utility in cancer patients. *J Pain Symptom Manage* 2002 Oct; 24(4):379-87.
 17. Davison SN. Chronic pain in end-stage renal disease. *Adv Chr Kidney Dis*. 2005 Jul; 12(3):326-34.
 18. Terzibasoglu AM, Akarirmak U, Saridogan M, Tuzun S. Correlation of back pain, compression fracture and quadriceps muscle strength with bone mineral density in renal insufficiency patients. *Eur Medicophys*. 2005 Dec;41(4):303-8.
 19. Kelly A, Apostle K, Sanders D, Bailley H. Musculoskeletal pain in dialysis-related amyloidosis. *Can J Surg*. 2007 Aug; 50(4):305-6.
 20. Figueiredo AE, Viegas A, Monteiro M, Poli-de Figueiredo CE. Research into pain perception with arteriovenous fistula (AVF) cannulation. *J Ren Care*. 2008 Dec;34(4):169-72.
 21. Milinkovic M, Zidverc-Trajkovic J, Sternic N, Trbojevic-Stankovic J, Maric I, Milic M, Andric B, Nikic P, Jovanovic P, Rosic P, Stojimirovic B. Hemodialysis headache. *Clin Nephrol*. 2009 Feb;71(2):158-63.
 22. Alhani F, Shad H, Anoosheh M, Hajizadeb E. The effect of programmed distraction on the pain caused by venipuncture among adolescents on hemodialysis. *Pain Manag Nurs*. 2010;11(2):85-91.
 23. Weisbord SD, Fried LF, Arnold RM, Fine MJ, Levenson DJ, Peterson RA, Switzer GE. Prevalence, severity and importance of physical and emotional symptoms in chronic hemodialysis patients. *J Am Soc Nephrol*. 2005 Aug; 16(8):2487-94.
 24. Kimmel PL, Peterson RA. Depression in Patients with End-Stage Renal Disease Treated with Dialysis: Has the Time to Treat Arrived? *CJASN*. 2006 Jan; 1(3):349-52.
 25. Kontodimopoulos N, Pappa E, Niakas D. Gender- and age-related benefit of renal replacement therapy on health-related quality of life. *Scand J Caring Sci*. 2009 Dec;23(4):721-9.
 26. Bailie GR, Mason NA, Bragg-Gresham IL. Analgesic prescription patterns among haemodialysis patients in the DOPPS: potential for underprescription. *Kidney Int*. 2004 Jun; 65(6):2419-25.
 27. Levey A, Eckardt KU, Tsukamoto Y, Levin A, Coresh J, Rossert J, De Zeeuw D, Hostetter T, Lameire N, Eknoyan G. Definition and classification of chronic kidney disease: A position statement from Kidney Disease: Improving Global Outcomes (KDIGO). *Kidney Int*. 2005 Jun;67(6):2089-100.
 28. Andreucci VE, Fissell RB, Bragg-Gresham JL, Ethier J, Greenwood R, Pauly M, Wizemann V, Port FK: Dialysis Outcomes and Practice Patterns Study (DOPPS) Data on Medications in Haemodialysis Patients. *Am J Kidney Dis*. 2004;44(5 Sup):S61-S7.
 29. Spiegel B, Melmed G, Robbins S, Esrailian E. Biomarkers and Health-related quality of life in End-Stage Renal Disease: a systematic review. *Clin J Am Soc Nephrol*. 2008 Nov; 3(6):1759-68.
 30. Conway BR, Fogarty DG, Nelson WE, Doherty CC. Opiate toxicity in patients with renal failure. *BMJ* 2006; Feb 11;332(7537):345-6.
 31. Hardy JR, Herbert AR, Reymond E. Opioids in patients on renal dialysis. *J Pain Symptom Manage*. 2007 Jan; 33(1):1-2.
 32. Eglence R, Karataş N, Taşci S. The effect of acupuncture on the level of fatigue in hemodialysis patients. *Altern Ther Health Med*. 2013 Nov-Dec; 19(6):23-31.
 33. Hogan MC, Norby SM. Evaluation and management of pain in autosomal dominant polycystic kidney disease. *Adv Chronic Kidney Dis*. 2010 May;17(3):e1-e16.

34. Grantham D, Brown S for the Winnipeg Regional Health Authority Group Pain Assessment and Management Clinical Practice Guidelines [cited 2014 Jan 20]. Available from: http://www.wrha.mb.ca/professionals/ebpt/files/PAM_CPG.pdf
35. Bohm C, Ho J, Duhamel T. Regular physical activity and exercise therapy in end-stage renal disease: how should we “move” forward? *J Nephrol.* 2010 May-Jun; 23(3):235-43.
36. Kafkia T, Zinelis D, Kourakos M. Exercise protocols in patients with Chronic Kidney Disease (CKD) and on Renal Replacement Therapy: A literature review. *Hellenic J Nurs Sc.* 2008; 1(2):55-9.