Do We Encourage Health or Illness? A Survey of Exercise Rehabilitation Practices for Patients in Australian Renal Units

White, Y. & Grenyer, B. (2006). Do We Encourage Health or Illness? A Survey of Exercise Rehabilitation Practices for Patients in Australian Renal Units. *Ren Soc Aust J* 2(1) 5–15

January 2006 Accepted March 2006

Abstract

Background: People with end stage renal disease (ESRD) have been reported as having low levels of physical activity. Sedentary behaviours increase illness risks which may lead to burdens on the public health system which include costs of medical care. Research has established that exercise is reported to improve general health and wellbeing. Benefits include better aerobic tolerance, maintenance and improvement in physical function and capacity, and improvement in self-concept and well-being. These same improvements also occur in an exercising ESRD population, even though the improvements might be of less magnitude. Renal unit staff can have a major impact on patients with ESRD by actively promoting exercise.

Purpose: The study surveyed renal units throughout Australia, to obtain information on exercise rehabilitation practices within these units.

Method: This was a descriptive single cross sectional study of dialysis units within Australia. Each unit was asked what exercise rehabilitation practices were conducted in their units at a basic, intermediate and advanced level. The survey questionnaire was adapted from the Unit Self-Assessment Manual for Renal Rehabilitation (The Life Options Rehabilitation Advisory Council [LORAC] 1998).

Results: Twenty-two units responded, a 52.38% return rate. On average, only 9% of the content of the education programs was related to exercise practices, and only 9% of units had organized fitness programs. Most of the education programs were related to diet and fluids, dialysis therapies, and vascular access care. 50% of units reported they regularly referred patients to occupational therapy and physiotherapy but the outcome of these referrals in terms of physical activity is unknown. Comments demonstrated that staff were aware of the importance of exercise, however many comments related to unmotivated patients and lack of resources (staff and finances) to support physical activity programs.

Conclusion: The results of this study suggest that there is a real need to actively develop physical activity rehabilitation programs within Australian dialysis units. With the large amount of literature now available reporting the benefits of exercise in those with ESRD, an important consideration for renal physicians and nurses is their 'duty of care' to their patients to promote physical activity.

Key Words
exercise, rehabilitation, renal, dialysis, end stage renal disease

Introduction

There abounds much research which discusses the low level of physical functioning in those with ESRD. Physical function and emotional well-being are essential components of quality of life (Painter 1994). Depression is a major concern in those with ESRD and has been associated with an increased mortality risk (Lopes 2002, Fukuhura et al 2003, Kimmel et al 1992). A study conducted by White (1998), reported results from an investigation into the biopsychosocial effects of end stage renal disease (ESRD). This study found that ESRD patients had a high incidence of depression (53%), perceived their health as poor, were fatigued, and were angry especially in regard to loss of physical function. The incidence of depression was interesting in that when somatic items were excluded, depression incidence decreased to 17%.

This finding suggests that impaired physical functioning has a large impact on the incidence of depression and is supported by previous studies (Kimmel 1992, Lopes et al 2002). Physical symptoms associated with ESRD are also a major concern to the patients (White & Grenyer 1998).

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In 2004 renal dialysis accounted for 539,303 separations being the leading diagnosis in all public hospitals, and the second most common in private hospitals and is equal to 42% of all separations (The Australian Institute of Health and Welfare [AIHW] 2006). In Australia there are 7,952 people on dialysis, with the number of dialysis patients increasing, with a 3% increase between 2003-2004 (Excell & McDonald, 2005). The average age of new dialysis patients in 2004 was 59.5 years (Excell & McDonald, 2005, p. 56), with 45% aged $\geq$ 65 years. The leading causes of ESRD are diabetic nephropathy (30%), glomerulonephritis (25%), hypertension (13%), polycystic renal disease (7%) and analgesic nephropathy (2%). 2004 is the first year where diabetes mellitus has become the leading cause of ESRD in new dialysis patients (Excell & McDonald 2005).

Mortality rates in ESRD are significantly related to concomitant comorbidities, with the leading causes of death in dialysis dependent patients in Australia being cardiac causes (76%), and withdrawal of dialysis (27%) which was the second highest cause of death. Cardiac causes included cardiac, cardiac arrest and myocardial infarction. Comorbidities which were clinically diagnosed as present in new patients to dialysis in 2004 included coronary artery disease (31%), peripheral vascular disease (18%), chronic lung disease (11%), and cerebrovascular disease (10%) (Excell & McDonald 2005).

Literature Review

Comorbidities and sedentary behaviours lead to burdens on the public health system. These burdens include costs of medical care and biopsychosocial health (Powell and Blair 1994). Causal relationships between a sedentary lifestyle and coronary artery disease, colon cancer and non-insulin dependent diabetes mellitus have been established (Sallis and Owen 1999). It can be said that patients with ESRD lead sedentary lives. They spend an average of 15 hours per week on haemodialysis therapy and it is well documented that immobilisation has systemic consequences and effects all bodily systems including psychological effects (Zimmerman et al 2006).

Numerous studies have shown that physical activity promotes health and well-being, as well as reduces the risk of death. Therefore by inference, being inactive will affect health and mortality risk negatively. Physical activity has been shown to be beneficial in cardiovascular disease (Paffenbarger et al 1993, Folsom et al 1990, Kelly and McClellan 1994, Stefanick and Wood 1994, Durstine and Haskell 1994), the prevention of obesity (Kahn et al 1997, Williamson et al 1993, Stefanick 1993, Grilo 1995, Barlow et al 1995), weight loss (Grilo 1995, Kayman et al 1990, Epstein et al 1994, Stefanick 1993), diabetes mellitus (Manson et al 1991, Manson et al 1992, Powell and Blair 1994, O'Dea 1991), cancer (Powell and Blair 1994, Lee 1994, Woods and Davis 1994, Richter and Sutton 1994), osteoporosis (Greendale et al 1995, Teegarden et al 1996, Jaglal et al 1995) and functioning in the elderly (Green and Crouse 1995, DiPietro 1996, Fiatarone et al 1994, Hopkins et al 1990). We suggest that an improvement in levels of physical activity will have similar positive effects on those with ESRD.

Exercise is reported to improve general health and wellbeing (The National Heart Foundation of Australia 2005). Reported benefits include better aerobic tolerance, maintenance and improvement in physical function and capacity, and improvement in self-concept and well being (Bauman 2004, Boyce et al 1997). These same improvements occur in the ESRD population, granted that some improvements might be of less magnitude (Karmiel 1996; Harter 1994, Painter 2005).

The importance of exercise for those with ESRD has been supported by various studies into exercise programs (Boyce et al 1997, Harter 1994, Karmiel 1996, Painter and Johansen 1999, Cheema and Fiatarone 2005, Painter 2005). Exercise has a very positive impact on the psychological well-being of those with ESRD, however there is a spiral of deconditioning (Painter 1994) which occurs in ESRD, and early exercise counselling and interventions may retard the deconditioning effect. "One of the biggest advantages of [an exercise program] is to witness positive functional changes in patients' lives...and see the impact on their independence" (Martin and Gaffney 2003, p.580).

The National Heart Foundation of Australia (2005) has recommended guidelines for physical activity levels, within the normal population, which will maintain and promote cardiorespiratory fitness. However, it is unknown if these recommendations are appropriate for those with ESRD. Painter (1994) has suggested that those with ESRD are only able to sustain sedentary behaviour due to the increase demand for energy caused by the catabolism associated with ESRD and the dialysing process itself. However studies mentioned previously involving exercise in those with ESRD dispute this.

There are many critical challenges to the development of a physical activity program for those with ESRD. These challenges include risk management, training, effectiveness and sustainability. Clinical experience suggests that renal units in Australia are focused on the disease of ESRD and the associated dialysis therapy, and give little time to general health promotion strategies. However, over the past decade there has

been a move internationally to promote exercise in those with ESRD.

A cursory combined data base search of Medline and Cinhal, elicited a total of 17 articles on exercise and dialysis from 1985 to 1994, and 349 in the period 1995 to 2006.

Figure 1 shows a cycle of physical inactivity in renal units. Accepting a patient's decreased physical functioning, has a flow on effect to the patient and their families and infers permission for the patient to become disabled and dependent. It is not expected that those with ESRD would become elite athletes, however an exercise program tailored to the individual's capabilities would maintain the patient's ability to perform the usual activities associated with their day to day living. The physical disability which occurs in ESRD is a major concern to patients (White & Grenyer 1998, Painter 1994). "The idea that [dialysis patients] will not exercise on a regular basis simply isn't true" (Patricia Painter cited in Jancin 2000, p.19). Some dialysis units have been able to commence physical activity/exercise programs but have been unable to sustain them. "These difficulties may have stemmed from resistance on the part of dialysis staff than from patients" (Carlson and Carey 1999, p.173).

Disability has a major impact on the individual's perceived quality of life, and as a consequence on the economy of nations as a result of lost years of productivity from those individuals. In the 1970's the World Health Organisation (cited in Zimmerman et al 2006, pp.24-25) developed the International Classification of Impairment, Disabilities, and Handicaps (ICIDH) model. This model consists of four concepts: active disease process, which leads to impairment, leading to disability, and finally to handicap. Disability is defined as "[the] restriction or lack of ability to perform an activity in [a] normal manner" (Zimmerman et al 2006, p. 25), and handicap as a "disadvantage due to impairment or disability that limits or prevents fulfilment of a normal role (depends on age, sex, and individual sociocultural factors)" (Zimmerman et al 2006, p.25). According to this model's definitions many people with ESRD may have a disability and/or handicap which will influence their perception of quality of life (QoL). QoL is conceived of many factors but "includes the [patient's] perception of [their] own health, including emotional well being, energy and vitality, sleep and rest, behavioural competence and general life satisfaction" (Zimmerman et al 2006, p.25).

During haemodialysis sessions patients lie in specialised chairs and are attached to dialysis machinery. This session time is for an average of five hours three times per week. During this time the patients are very sedentary with little or no movement encouraged by staff. This lack of movement for three five hour sessions per week promotes the effects of immobility – for example muscle wasting, and deep venous thrombosis (mainly prevented during dialysis due to heparinisation during therapy), and limited lung expansion (Krasnoff and Painter 1999). These effects of immobility are compounded by anecdotal reports of low levels of physical activity undertaken by patients with ESRD outside dialysis hours. However, there is increasing evidence and trends towards using this period of dialysis to incorporate exercise routines (Painter 2005). To understand the current status of clinical practice a study was undertaken to investigate the involvement of renal units in Australia in the promotion of physical activity.

Purpose of Study

The study surveyed renal units throughout Australia, to obtain information on exercise rehabilitation practices. The specific research question was: Do renal units actively encourage physical activity of dialysis patients? It was hypothesized that renal units in Australia do actively encourage physical activity.

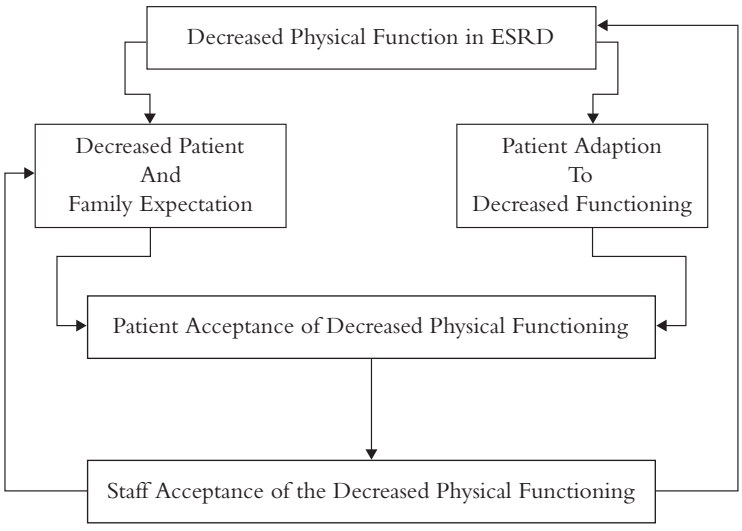

Figure 1: Cycle of the Promotion of Physical Inactivity within Renal Units

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Method

This was a descriptive single cross sectional study of dialysis units within Australia. Potential participant units were recruited from across all states in Australia. The addresses for these units were obtained from the Australian Dialysis Unit Guide (Australian Kidney Foundation, 2002).

The units were randomly selected. Randomisation was by a stratified technique (Borbasi et al 2004, p. 109), placing all renal units from the Australian Dialysis Unit Guide into characteristic groups, which commenced initially by state groups. State groups were further divided into metropolitan, rural and remote renal units. Random selection was then undertaken using a lottery draw from each of the three groups (metropolitan, rural and remote units). There were 42 units selected from a possible number of 176, this was 23.86% of all potential units.

The major renal units in Australia are located in metropolitan and large regional centres (e.g. Dubbo, Tamworth), and each of these major units has several satellite units attached to them. Units which were under a parent unit and had been selected more than once were discarded as it was presumed that practices in these units would be similar due to the medical direction of these units.

The units selected included metropolitan, regional, rural and remote area units. The nurse unit manager of these units was the point of contact. The survey questionnaire was distributed via mail to the selected units, and contained a reply envelope for the return of the survey questionnaire. The return of the questionnaire implied the participant's consent to participate in the research study. Approval from the Human Research Ethics Committee of the University of Wollongong was obtained prior to the commencement of the study.

The questionnaire which was distributed to the chosen renal units was adapted from the Unit Self-Assessment Manual for Renal Rehabilitation (The Life Options Rehabilitation Advisory Council (LORAC 1998). This manual allows for a standardized approach to renal rehabilitation. On review of the literature no publication was found which described the use of the unit self-assessment tool. However, the present study offered the opportunity for this to occur.

The unit self-assessment tool is a 100 item check list, which is divided into five categories identified by LORAC (1998). These categories are encouragement, education, exercise, employment and evaluation. Within each category there are three levels – basic, intermediate and advanced (LORAC 1998). The basic level describes rehabilitation strategies which are easy to implement such as provision of standard brochures. The intermediate level involves strategies such as systematic goal setting, group exercise activities and referrals to other health care personnel. The advanced level is the level which is overtly and actively focused upon rehabilitation and looks at patient satisfaction, research and evaluation aspects. The basic and advanced levels have a possible score range from 0-35, and the advanced level from 0-30.

For this current study we chose only to use specific questions from the exercise and evaluation category criteria in relation to exercise and physical functioning. Within the exercise category there were 4 questions chosen from both the basic and intermediate levels, and 6 from the advanced level (LORAC 1998). There were more questions from the advanced level as this demonstrated an active commitment to exercise rehabilitation.

Three questions were chosen from the rehabilitation evaluation criteria. Two of these were at the basic level and one from the advanced level (LORAC 1998). These questions provided information on the evaluation of the patient's overall physical function, patient satisfaction with their level of rehabilitation and if any research regarding rehabilitation outcomes and evaluation was undertaken by the units surveyed.

Therefore this modified unit assessment was specific to exercise and general rehabilitation in relation to physical activity undertaken by the surveyed units. The specificity of the questionnaire was designed to complement the physical activity focus of the study. All questions on the survey questionnaire had a possible score range from 0-18 – all questions were scored from 1 = yes (i.e. unit met the criteria), to 2 = no (unit did not meet the criteria) (LORAC 1998).

Results

Of the forty-two renal units randomly chosen to be surveyed, there was a final sample of twenty-two units who completed and returned the survey questionnaire, which was a 52.38%, return rate. Study sample unit demographics are shown in Table 1. The nurse unit manager was the person who completed the survey in most cases, and most responses were from metropolitan units and from New South Wales.

Each unit was asked if they had an education program and what were the five major areas covered within the program. Figure 2 shows the general content of the education programs from the units surveyed. As can been seen 86.5% of the content of these education programs were related to ESRD or dialysis. The content of the education programs contained only 13.6% related to aspects such as exercise, lifestyle and the psychosocial impact of ESRD. Most

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Table 1. Study Sample Unit Demographics (n=22)

Category of Person Completing the Survey	NUM CNS CNC RN	16 2 3 1
Location of Renal Unit	Metropolitan Regional Remote	13 8 1
States of Survey Respondents	NSW Victoria WA QLD	13 5 2 2
Funding Source	Public Money (Government funded) Private Money (Dialysis company funded)	21 1
Mode of Dialysis Offered by Units	Haemodialysis only Haemodialysis and Peritoneal Dialysis	10 12

of the education programs were related to diet and fluids, dialysis therapies, and vascular access care.

Of the units surveyed there were 13.6% (n=3) metropolitan units and 18.2% (n=4) regional centres that did not have either an exercise rehabilitation or education program. Only 10% (n=2) units had a general rehabilitation program. Each unit was asked several questions relating to exercise rehabilitation practices within their units. These responses were analysed and categorised into basic, intermediate and advanced levels as per the LORAC unit survey criteria. This analysis demonstrated that the rehabilitation interventions were mostly at the basic level (21.5% of respondent units) and intermediate level (23.8% of respondent units). Most of these were strategies which did not involve the renal units actually undertaking an active role in exercise rehabilitation. The strategies reported in this group were related mainly to the availability of exercise literature and videos, and referrals to outside exercise programs – however there was no comment made, by respondents, as to what these programs involved, or if the referrals to community exercise programs were followed up.

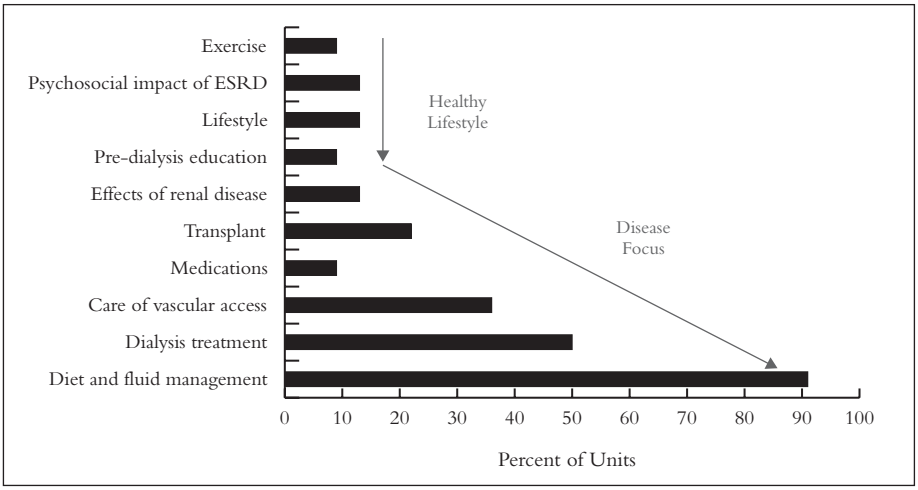

Figure 2: Study Sample Renal Units General Content of Education Programs (n=22)

Figure 3 shows those units reporting intermediate and advanced level criteria for exercise rehabilitation. Only 11.3% of respondent units had advanced level strategies. The main strategy here is the referral of patients to other health care professionals (e.g. physiotherapists and Occupational Therapists = 50% of respondent units), which is an intermediate level strategy.

As can be seen the majority of units have no strategies at the advanced level. Therefore this may suggest that there are few active exercise rehabilitation

programs in Australian renal units. A further disappointing inference which may be made from these results is that physical function and the ability to perform normal activities of daily living of people with ESRD may not be assessed regularly. 40% of units reported regular assessment of physical function, but made no comment on what these were or how the information was used. This result is in some conflict with reports that show 13.6% (n=3) units evaluated change in physical function. It is also disappointing that only 4.5% (n=1) participate in exercise rehabilitation research.

At the end of the survey questionnaire there was an area in which the respondents could make comments in regard to the survey. All of the comments which were made are listed verbatim in table 2. The table categorises the responses into positive, negative and ambivalent responses. Most comments demonstrated that staff were aware of the importance of exercise, but appear somewhat ambivalent by noting awareness but providing no strategy to address this. Many comments related to unmotivated patients and lack of resources (staff and finances) to support exercise programs.

Discussion

Results from this study do not support the hypothesis that renal units in Australia actively encourage physical activity and rehabilitation. Results suggest support for the cycle of physical inactivity (figure 1), and as a consequence renal unit practices may contribute to the deconditioning of people with ESRD as described by Painter (1994).

The literature review undertaken during this study found many studies of exercise programs in those with ESRD. However most of these were short term

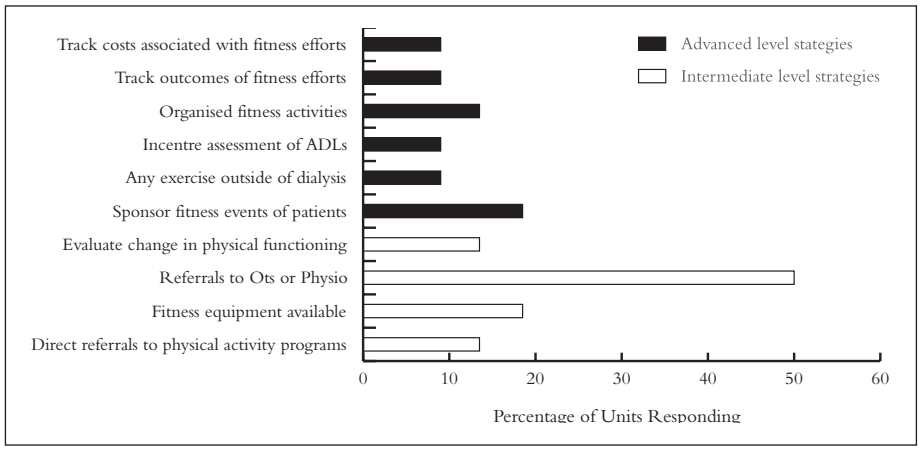

Figure 3: Exercise Rehabilitation Strategies (Intermediate and Advanced Level) reported by Renal Units (n=22)

Table 2. Study Sample Renal Units Comments in Relation to an Exercise Program in the Units (n=22)

Positive Comments	• Have purchased exercise bikes and have a once a week exercise program • We have exercise and fitness program for patients on haemodialysis not peritoneal dialysis • Really encouraged for potential transplant patients otherwise time and resources are very limited
Negative Comments	• Very difficult, unmotivated patients • Elderly Patients are difficult to motivate • Providing home haemodialysis patients with the chance to be back at work and be productive in their community is a rehabilitation process itself • Need time, staffing • It is usually overlooked • Very much not funded, not valued or recognised part for ESRD patients • Extremely difficult to provide on-going assessment and in-centre training program due to restricted budgets. • We have attempted to involve physio in exercise but have been unable to get his service.
Ambivalent Comments	• Rehabilitation should be developed as it would be beneficial to patients • Have informal education program • Definitely need to look at this issue • This is an area greatly overlooked • We do hold a lifestyle seminar annually which includes input from personal trainers, yoga instructor, massage relaxation therapist, and gym instructors on suitable exercise

programs ranging from 3-6 months in most instances and all reported positive outcomes of exercise for those with ESRD on an emotional, social, physical, and QoL level (Kouidi et al 1998, Ridley et al 1999, Mustata et al 2004, Painter et al 1986,2000 a, 2000b).

It was pleasing to note that there are some units, which do have resources available in relation to the promotion of exercise within their units, with only 2 units having an organised fitness program during dialysis. It was also pleasing that 10 units regularly refer patients for occupational therapy and/or physiotherapy evaluations and treatment. However, this may suggest that these units are promoting living with disability rather than the improvement of physical function and fitness.

Further, the study supports the premise that the majority of renal units are very focused upon ESRD and dialysis and not on the promotion of healthy living. Clinical wisdom would suggest that this is most likely related to the workload and acuity of patients within dialysis units in general, and the lack of resources to support exercise programs. However, over the past decade much literature has been published reporting the beneficial effects of increasing physical activity in those with ESRD (Kouidi et al 1998, Ridley et al 1999, Mustata et al 2004, Cheema and Singh 2005, Painter et al 1986, 2000 a, 2000b, 2005). It would appear that nurses and renal physicians have largely ignored this information as evidenced by the lack of active exercise programs. "Common barriers to starting and/or maintaining an exercise program include lack of time, staff, and resources, as well as the low priority placed on exercise by staff, administrators and physicians." (Carlson and Carey 1999, p.173). This was supported by comments made by the respondents (Table 2).

Studies have reported that renal unit staff have significant influence on the people they care for (Carlson and Carey 1999, Painter et al 2004). Findings from a study reported that 22% of the staff surveyed never asked patients about their physical limitations in their activities of daily living, and 24% never or rarely encourage their patients to exercise (Painter et al 2004). However, 75% of staff surveyed stated that they did have time in their routine day to discuss and encourage exercise (Painter et al 2004). This same study further reported that 44% stated that most people do not expect patients to exercise, 14% think that patients do not want to participate in regular exercise, and 36% thought that patients lacked motivation to exercise (Painter et al 2004).

Limitations of Study

A major limitation of this study was the small sample, however the results were from a broad renal unit base and do provide an indication that exercise is not a priority in most units. The assessment tool utilized allowed for certain information to be provided, but did not encourage respondents to clarify certain points. The findings from this small survey do provide a baseline for future research and interventions to be implemented to address the need for comprehensive rehabilitation strategies within dialysis units to promote the general health of the patients, not just disease management

Implications for Renal Nursing

The implications of this study for renal nursing practice include the overt recognition of the poor physical function in those with ESRD. Renal nurses have a prime opportunity to undertake a major role in the initiation of physical activity practices within their dialysis units and to contribute to current knowledge in regard to physical activity in chronic disease. They may also contribute to the development of healthy public policy in relation to physical activity guidelines for those with ESRD.

Recommendations

The findings of the study provide beginning recommendations to promote physical activity in those with ESRD. These include the development of active rehabilitation programs to increase the patient's physical capabilities, which in turn would improve their perception of emotional well-being and QoL. "If we're not addressing the low physical functioning that's documented to exist in our dialysis patients, how on earth are they going to be independent, and how is it we are optimising quality of life?...I think we're negligent in not prescribing [exercise for our patients]." (Patricia Painter quoted in Jancin 2000, p. 18).

Another recommendation is that renal nurses take a leading role in the promotion of general health for those with ESRD by promoting physical activity in the patients they care for. By undertaking this 'leadership' role they would act as role models for other renal nurses and thereby promote a shift in focus of renal units from one of disease to one of the promotion of self-care management and tertiary level health promotion.

A further recommendation would be to include functional assessments and physical activity programs into quality improvement strategies for units as one way to promote staff interest in the promotion of regular physical activity and to optimise patient outcomes.

Conclusion

The results of this study suggest that there is a real need to actively develop rehabilitation programs within dialysis units. This would require lobbying government to provide specific program funding, and changing the focus of renal unit culture from disease focus to one of healthy living with a chronic illness. With the large amount of literature now available reporting the benefits of exercise in those with ESRD, a very important consideration for renal physicians and nurses and their 'duty of care' to their patients is to promote physical activity in those with ESRD. Improved physical activity levels in those with ESRD would have a positive impact on patients' physical and psychological functioning which would reduce costs to the Australian Health Care System. Positive effects on staff have also been reported. "Just walking into a dialysis unit where patients are exercising has a positive effect on me as a nephrologist, on my nurses, my techs, my dieticians, my secretaries." (a renal physician quoted in Jancin 2000, p. 18).

Clinical experience suggests the culture of renal units in Australia is strongly focused on the medical model, and staff (nurses and doctors) may not believe that the patients they care for can lead fulfilling lives, and "These perceptions are passed on to patients and family members and hinder rehabilitation by minimizing what patients believe they can achieve." (Calson and Carey 1999, p.173). However, counselling and the encouragement of exercise early in the pre-dialysis phase will promote the development of regular physical activity which will retard deconditioning and disablement in those with ESRD.

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