



## Review

# Limited evidence for the effectiveness of educational interventions for renal transplant recipients. Results from a systematic review of controlled clinical trials

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## ARTICLE INFO

## Article history:

Received 10 May 2012

Received in revised form 29 September 2012

Accepted 5 October 2012

## Keywords:

Educational interventions

Renal recipients

Systematic review

Controlled clinical trials

## ABSTRACT

**Objective:** To describe the content and evaluate the effectiveness of patient education programs for renal recipients.

**Methods:** Randomized controlled trials (RCTs) and controlled clinical trials (CCTs) were identified through systematic literature searches in the Cochrane Central Register of Controlled Trials, Medline, Embase, CINAHL, and ERIC. Reference lists and reviews were also examined. Methodological quality was evaluated according to criteria developed by the Cochrane Musculoskeletal Group. Interventional effects were summarized qualitatively.

**Results:** Nine trials were included, and three were RCT's. The educational interventions varied regarding focus, timing and intensity. No studies were assessed to have low risk of bias. Only two studies, which had a moderate risk of bias, reported beneficial effects in favor of the educational interventions. The strongest evidence was found for the use of preparatory video-assisted teaching prior to discharge and monthly pharmaceutical counseling.

**Conclusion:** Few included studies with moderate to high risk of bias suggest limited evidence for the effects of educational interventions for renal recipients.

**Practice implications:** Studies with stronger designs and improved reporting standards are needed. Future educational interventions should include a holistic educational approach and be provided in both early and later stages post transplantation. Furthermore, additional long-term outcome measures are needed.

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## 1. Introduction

For patients with end-stage kidney disease, transplantation is the treatment of choice [1–3]. In order to reduce rejection episodes, graft loss and the negative consequences of life long immunosuppressive medication, renal recipients need to acquire knowledge about immunosuppressive medication, graft surveillance and the benefits of specific lifestyle behavior [4,5]. Patients experience the situation after the renal transplantation as complex [6,7], and learning difficulties may occur due to physical and mental stress in the peri-transplant situation. Hence, focus on effective patient education seems important for this group of patients.

Previous reviews in the field of renal diseases have mainly focused on patient education prior to the transplantation [8]. Renal recipients were excluded in the most recent review because of

their specific educational needs [9]. De Bleser et al. [10] reported a systematic review of interventions to improve medication adherence after solid organ transplantation, including kidney transplants. But besides medication adherence, knowledge about signs of graft loss and the benefits of specific lifestyle behaviors may be of great importance. According to Osborne et al. [11], knowledge has a valuable impact on outcomes such as self-efficacy, behavioral changes and quality of life.

Developing effective educational interventions for renal recipients requires gathering the available information on research about patient education for the *specific* group of renal recipients including a broader outcome focus than previous reviews have reported. Hence, we think this justifies an updated, systematic review on the efficacy of patient education for renal recipients.

### 1.1. Objectives

The purpose of this systematic literature review was to describe the content and evaluate the effectiveness of patient education programs for renal recipients.

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## 2. Methods

### 2.1. Selection criteria

All randomized controlled trials (RCTs), quasi-randomized trials using inadequate generation of sequence allocation and controlled clinical trials (CCTs) were considered for inclusion. All renal recipients, both males and females of all ages, were considered, and all types of educational and counseling interventions were included. Relevant outcome measures were included/categorized according to Osborn's Program Logic Model [11]. In this model, outcomes of health education are divided into three different levels, categorized as proximal outcomes (i.e., knowledge, compliance), intermediate outcomes (i.e., decreased symptoms, self-confidence, health-related quality of life) and distal outcomes (i.e., use of acute health care).

### 2.2. Search strategy

We performed a systematic literature research and included randomized controlled trials (RCTs), controlled clinical trials (CCTs) (using inadequate sequence allocation) to examine the effectiveness of educational interventions for renal recipients. Cochrane Central Register of Controlled Trials, Medline, Cochrane Library, ERIC, Embase, Psycinfo and Cinahlare the databases we searched up to May 2011. We used the following MeSH terms: "Kidney transplantation as topic" (including Transplantation Kidney, Kidney Transplantations, Transplantations, Kidney, Transplantation Renal, Renal Transplantation, Renal Transplantations, Transplantations Renal, Grafting Kidney, and Kidney Grafting) combined with "Patient education as topic" (including Education of Patients, Education, Patient, and Patient Education), as well as "Kidney transplantation as topic" combined with Counseling, defined as "The giving of advice and assistance to individuals with educational or personal problems".

### 2.3. Study selection

Two researchers independently assessed the list of titles and abstracts for full-text review. Full-text articles were obtained for all potentially relevant studies, including those in which sufficient information could not be obtained from the title and abstract alone. All full-text articles were then independently assessed and included in the review, if they met all selection criteria.

### 2.4. Assessment of methodological quality

Two reviewers independently assessed each study according to guidelines developed by the Cochrane Musculoskeletal Group [12]. The following seven quality criteria were assessed as either 'met', 'unclear' or 'unmet': random generation of allocation, concealment of allocation, outcome assessment, cointervention, losses to follow-up, blinding of provider or patient, and intention-to-treat analysis. Based on this assessment, we grouped studies into low ('met' six or seven criteria), moderate ('met' three to five criteria), or high risk of bias ('met' fewer than three criteria). These criteria are general and in accordance to recommendations in the Cochrane Handbook for Systematic Reviews of Interventions [13].

### 2.5. Data extraction and analyses

Two of the researchers independently extracted the data from each article concerning study design, methods, participants, interventions, and outcome. Any discrepancies were resolved by discussion. Since no included studies had similar interventions, populations or outcomes, we summarized the effects qualitatively.

## 3. Results

### 3.1. Search results

Searches in Medline with the limitation "clinical trial" resulted in 12 hits. After having excluded papers dealing with dialysis patients, four studies were included [14,16,19,23]. When the limitation "clinical trial" was removed, the number of publications increased to 315. However, after going through titles/abstracts/full text, only two of these were found to meet the inclusion criteria [20,22]. A further search in Embase resulted in two additional relevant publications [18,21]. Two more relevant were trials was retrieved from the reference list of a systematic review [10] regarding medication adherence for organ transplant recipients [14,17]. One was an abstract published in a conference proceeding, but it was not included because of a lack of any further available information about the trial [17].

### 3.2. Study characteristics

Nine studies, conducted between 1985 and 2010, were finally included. Three studies were from Europe [15,20,22], one from Asia [23], and the remaining from the USA [14,16,18,19,21]. The sample size ranged from 18 to 110 patients. Seven studies included renal recipients over 18 years old. One study included patients over 15 years old [18]. One study focused on adolescent transplant patients only [20], and one included children, adolescents and their parents [19]. Three studies were RCT's [14–16], while the rest used a design with an experimental and control group according to inclusion criteria. The nine studies included are presented in Table 1.

### 3.3. Characteristics of interventions

These nine selected interventions differed regarding focus, timing and intensity. They varied from being provided preoperatively [23], in the early postoperative phase [16,18,21,22] to several years post-transplant [15,20]. Two interventions focused on children and adolescents [19,20], and one focused on patients considered non-compliant to medication [15]. The remaining reports were on adult renal recipients in different phases post-transplantation.

Interventions were implemented in various locations, e.g. in-hospital [16,18,21,23], outpatient clinic [14,19,20], at home [15] or in combination of outpatient clinic and in-hospital settings [22]. The intervention personnel included a clinical nurse [15,19,23], nurses and assistants [21] and clinical pharmacists [14]. In two studies, the interventions were delivered by using video and computer techniques [16,20]. Intervention lengths varied from 30 to 60 min [20] to 1 year [14].

Six studies focused on education/cognitive strategies [16,18,21,23], whereas five utilized a combination of educational/cognitive and counseling/behavioral interventions [14,15,19,20,22]. Only one study described a theoretical framework for the intervention, using Bandura's Social Cognitive Theory [15].

Table 2 systematically presents the characteristics of the nine interventions regarding purpose, content, timing, duration, location and provider.

### 3.4. Outcomes

All except one study [22] used outcomes measures according to what the Program Logic Model has categorized as "proximal outcomes". Six of these focused on increases in knowledge [16,18–21,23], often in combination with compliance, and outcomes in the intermediate category, such as renal function, weight, and laboratory values. Three studies utilized so-called

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