



Review Article

Multidisciplinary care in patients with chronic kidney disease: A systematic review and meta-analysis



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ABSTRACT

Background: Multidisciplinary care (MDC) was widely used in multiple chronic illnesses but the effectiveness of MDC in patients with chronic kidney disease (CKD) was inconclusive. The aim of this meta-analysis is to estimate the effectiveness of MDC for CKD.

Methods: We searched PubMed, Web of Science, Google Scholar, Cochrane Library, and China Journal Full-text Database for relevant articles published in English or Chinese. Studies investigating MDC and non-MDC in patients with CKD were included. Random effect model was used to compare all-cause mortality, dialysis, risk of temporal catheterization, and hospitalization in the two treatment entities.

Results: We analyzed 8853 patients of 18 studies in patients with CKD stages 3–5, aged 63 ± 12 years. MDC was associated with lower risk of all-cause mortality with an odds ratio (OR) of 0.52 [95% confidence interval (CI): 0.44–0.88, $p = 0.01$], mainly in cohort studies. MDC was associated with a lower risk of starting dialysis ($p = 0.02$) and lower risk of temporal catheterization for dialysis ($p < 0.01$). MDC was not associated with a higher chance of choosing peritoneal dialysis ($p = 0.18$) or a lower chance of hospitalization for dialysis ($p = 0.13$).

Conclusions: Limited evidence from randomized controlled trials is currently available to support the benefit of MDC in patients with CKD. MDC is associated with lower all-cause mortality, lower risk of starting dialysis, and lower risk of temporal catheterization for dialysis in cohort studies. MDC is not associated with a higher chance of choosing peritoneal dialysis or a lower chance of hospitalization for dialysis. More studies are needed to determine the optimal professional that should be included in MDC.

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1. Introduction

Chronic kidney disease (CKD) is a global health issue associated with an increased mortality and substantial health care costs [1]. As care for patients with CKD is complex, a coordinated multidisciplinary care (MDC) may be needed to improve the management and outcomes in patients with CKD [2]. MDC had been widely used in clinical settings such as patients with heart failure [3,4], patients with delirium [5], patients in intensive care [6], and cancer patients [7,8]. MDC had also been used in patients with CKD but the beneficial effects of MDC on CKD patients' clinical outcomes were controversial in the published studies. MDC was associated with lower all-cause mortality [9–11] and lower risk of dialysis [10,12] in some but not all studies [13–15].

MDC is a form of care of patients that consists of professionals from a range of disciplines with different but complementary skills, knowledge, and experience. These professionals work together to deliver comprehensive healthcare aimed at providing the best possible outcome for the physical and psychosocial needs of a patient and their caregivers [16]. As these needs may vary with time and circumstances, the composition of the MDC team vary accordingly. Understanding of the composition of MDC team such as what professionals should be included may help to improve the effectiveness of MDC. In this study, we investigated the effect of MDC on patient's outcomes using meta-analysis based on the published data. We also identified the professionals included in the MDC for CKD in the published studies.

2. Methods

2.1. Search strategy

The overview of this meta-analysis was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-

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analysis (PRISMA) statement [17]. Two investigators (IW and HL) searched all relevant articles from Jan 1980 to Dec 2014 using PubMed, Web of Science, Google Scholar, the Cochrane Library, and China Journal Full-text Database. We used the following search key words: “multidisciplinary care”, “interdisciplinary care”, “pre-dialysis program or care”, and “chronic kidney disease”, “end-stage renal disease”, and “chronic renal failure”. The languages chosen were English and Chinese. We also manually searched the references of selected articles to identify additional potentially relevant studies.

2.2. Selection criteria

The articles included in the meta-analysis were as follows: (1) Articles published in peer-reviewed, English- or Chinese-language journals between January 1980 and Dec 2014. (2) Studies reported MDC and non-MDC in adult patients with CKD without dialysis. (3) Studies reported patient number of mortality, starting renal replacement therapy (hemodialysis, peritoneal dialysis, and kidney transplant), hospitalization for dialysis, and temporal catheterization for dialysis. (4) Studies reported professions involved in the MDC.

2.3. Data extraction and quality assessment

Two investigators (SM and CC) independently reviewed the full manuscripts of the studies included and extracted the data in a standardized data-collection form. The data extracted included first author's name; year of publication; study design; region; sample size; patients' mean age; number of participants in each group; number of participants died, number of participants commenced hemodialysis, peritoneal dialysis, or kidney transplant, number of participants hospitalized for

dialysis, number of patients on temporal catheterization for dialysis, and professionals included in the MDC. Any discrepancy was resolved by discussion or a third author (JH).

2.4. Statistical analysis

All meta-analyses were performed using the Comprehensive Meta-Analysis (version 2, Biostat, Englewood, NJ, USA). We calculated odds ratios (ORs) and corresponding 95% confidence intervals (CIs) for each outcome and studies separately and checked the findings against published data for accuracy. We calculated numbers of outcome events using the event rates and sample size. Outcomes were then pooled and compared with a random-effects model. We analyzed the appropriateness of pooling of data across studies using the Cochran Q statistic and I^2 test for heterogeneity. The random effect model was used to minimize the potential heterogeneity between studies.

3. Role of the funding source

There was no funding source for this study. All authors had full access to all the data in the study and had the final responsibility for the decision to submit for publication.

4. Results

4.1. Literature search

Our initial literature search yielded 754 citations and 63 potential citations from the references link (Fig. 1). After the removal of 456 duplicates, 361 citations were screened at the level of title or abstract.

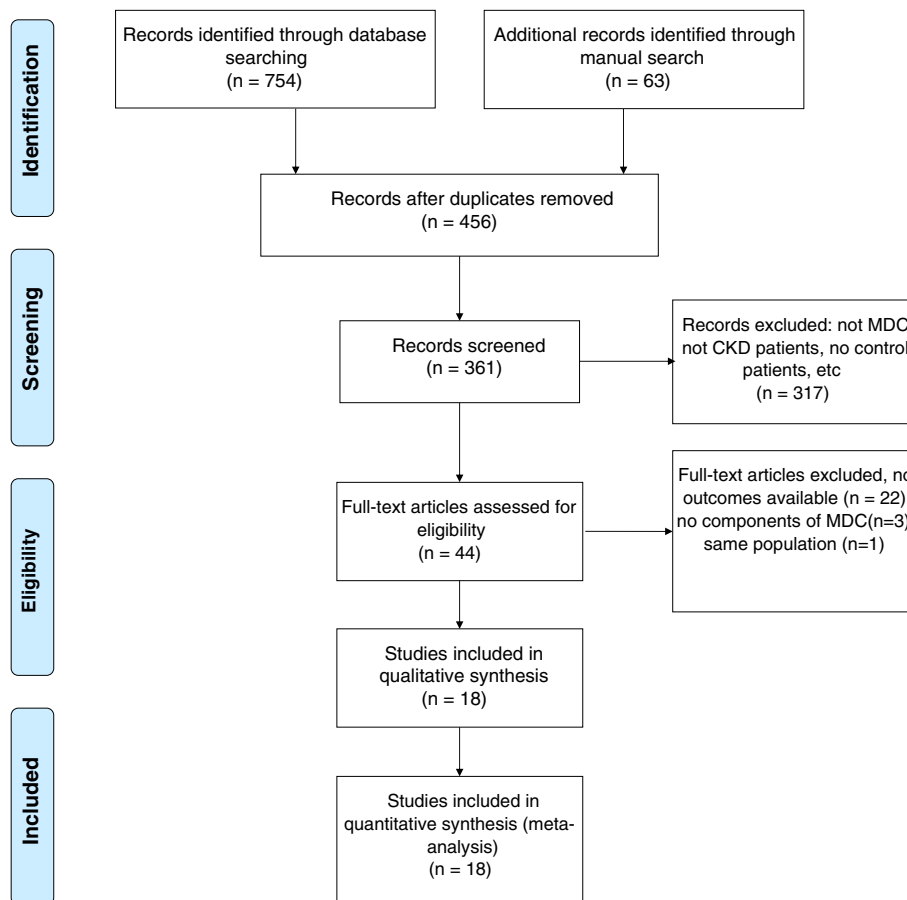


Fig. 1. Flow chart of meta-analysis.

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