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Original Article

Effect of motivational interviewing on self-management in patients with type 2 diabetes mellitus: A meta-analysis

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ABSTRACT

Objective: The objective of this meta-analysis was to evaluate the effect of motivational interviewing (MI) on self-management in patients with type 2 diabetes.
Methods: Randomised controlled trials that assessed the effects of MI on self-management and HbA1c levels in patients with type 2 diabetes were systematically reviewed using multiple electronic databases. Weighted mean differences with 95% confidence intervals were calculated for continuous data.
Results: Ten trials were included in this meta-analysis. The self-management ability of patients with type 2 diabetes who underwent MI was significantly better than that of patients in the control group (WMD, 2.37; 95% CI, 1.77–2.98; $p < 0.00001$). Subgroup analysis showed that short-term MI ($\leq$6 months) resulted in a significant decrease in the HbA1c level ($p < 0.05$) but that this advantage was not present for relatively long-term MI (>6 months) ($p > 0.05$).
Conclusions: MI was associated with improved self-management abilities among patients with type 2 diabetes, and short-term MI ($\leq$6 months) effectively decreased the HbA1c level. The effect of long-term MI (>6 months) on the HbA1c level remains uncertain. Large-scale, higher-quality randomised controlled trials are needed to confirm the present findings.
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1. Introduction

The prevalence of type 2 diabetes is rapidly increasing due to population ageing and lifestyle changes [1]. Self-management is the basis for treatment of type 2 diabetes and is critical in the prevention of complications. Nurse-led health education has been one of the most important methods of helping these patients to strengthen their self-management abilities [2].

However, a previous study showed that health education programmes that provide traditional advice have a success rate of only 5%–10% [3]. Therefore, effective new approaches to helping patients improve their self-management abilities are urgently needed. Motivational interviewing (MI) is a patient-centred behaviour-changing strategy that aims to identify and reduce patient ambivalence regarding health behaviour changes and improve patients' perceptions of the importance of behaviour changes [4,5]. MI is valuable in the

treatment of addictions and other chronic medical conditions, including type 2 diabetes [6]. Recent studies have shown that MI can contribute to improvements in self-management abilities in patients with type 2 diabetes [7,8]. However, many professionals remain concerned about the applicability of these results because of the great variation in interventional designs and questionable evaluation indices. Therefore, we conducted the present meta-analysis to assess the effects of MI on the self-management ability of patients with type 2 diabetes and to provide evidence for the use of MI in nursing practice.

2. Design and method

2.1. Inclusion and exclusion criteria

2.1.1. Study type
Randomised controlled trials (RCTs) in both Chinese and English were eligible for inclusion in this meta-analysis.

2.1.2. Study objective
Patients with type 2 diabetes aged >18 years who were able to independently care for themselves were eligible for inclusion in this study. Patients with other severe medical conditions or complications such as stroke, malignant tumours, ketoacidosis, or critical diabetic nephropathy were excluded.

2.1.3. Study intervention
MI was provided to patients in the study group. Trained and qualified professionals acted as the interviewers. The intervention plan was formulated by the interviewer and generally comprised two steps. First, the patients were assisted in strengthening their internal motive for behaviour changes. Second, the patients were assisted in consolidating their commitment to and carrying out the plan for these behaviour changes. Self-management–related knowledge was introduced to the patients in the control group using traditional health education methods, such as collective classes.

2.1.4. Outcome measures
The primary outcomes were the HbA1c level (%) and the self-management ability. The measurement tools used to evaluate the self-management ability included the Summary of Diabetes Self-Care Activities (SDSCA) and the Type 2 Diabetes Self-Care Scale (2-DSCS).

2.2. Search strategy

Medline, PubMed, JBI Library, CINAHL, EMBASE, the Cochrane Library, CNKI, VIP, Wanfang, Google, and Google Scholar were electronically searched up to January 2014 using combinations of the following search terms: "diabetes," "motivational interviewing," "self-care," "self-management," and "behavior change." The titles, abstracts, and reference lists of all identified reports were independently examined by D.S. and T-Z X.. Disagreements were resolved by discussion or consensus with Q-H. S..

2.3. Assessment of methodological quality

The methodological quality of all RCTs was graded with the Cochrane Handbook, version 5.1.0, which assesses studies according to the method of randomisation, adequacy of allocation concealment, blinding of outcome assessment, proportion of patients lost to follow-up, performance of intention-to-treat analysis, and comparability of baseline data. The risk of bias in each RCT was graded from A to C, where A, B, and C indicated low, medium, and high risk, respectively. All disagreements were resolved by discussion.

2.4. Data extraction

We independently extracted data from all studies using standardised forms. These data included the study design, sample size, type of procedure, numbers and reasons for withdrawals and dropouts, and all aforementioned outcome variables. All disagreements regarding values or analysis were resolved by discussion.

2.5. Statistical analysis

This meta-analysis was conducted using RevMan 5.2.0 software (Cochrane Collaboration, Oxford, UK). Data were evaluated by means of weighted mean differences (WMDs) and 95% confidence intervals (CIs). Heterogeneity was explored by the I^2 test. If $I^2 < 50\%$, a fixed-effects model was employed; otherwise, a random-effects model was used. Subgroup analysis was performed according to the heterogeneous factors considered. A narrative overview was conducted when synthesis was inappropriate.

3. Results

3.1. Study selection

The initial search strategy generated 427 studies. After screening all titles and abstracts, we identified 23 potentially eligible trials. On further assessment, 13 trials were excluded because they either did not meet the inclusion criteria or met the exclusion criteria. Finally, 10 trials [7–16] involving 2947 patients were included in this meta-analysis. The details of the included trials are summarised in Table 1.

3.2. Methodological quality

The results of the methodological quality assessment of all included trials are shown in Table 2.

3.3. Primary outcomes

3.3.1. Effects of MI on HbA1c level
All 10 trials [7–16] reported assessment of the effects of MI on the HbA1c level. One trial [15] was excluded because it did not mention the intervention time. A subgroup analysis was performed according to the intervention period (3, 6, 12, 14, 18, or 24 months). The heterogeneity test result revealed an I^2 of >50%; thus, a random-effects model was used.