

Use of Motivational Interviewing for Diabetes Mellitus- Effects of Treatment, Client Perceptions and Professional Training

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Abstract

Background: Motivational interviewing (MI) is a bio psychosocial strategy aimed at implementing health-related behavioral modification through counselling in a provider-client interaction in healthcare. Diabetes mellitus (DM) is a metabolic disorder of glycemic control influenced by diet, physical activity and lifestyle, all of which are influenced by MI. **Objective:** To evaluate the evidence for use of MI in people with DM. **Methods:** A systematic review was performed using search terms, “motivational interviewing and diabetes/ diabetic” to identify studies which were descriptively categorized under prevention and treatment of DM. **Results:** Of the 27 included studies, there was one study on prevention, 21 studies on treatment (effects of treatment=15; patient perceptions=6) and five studies on effects of professional education/ training. **Conclusion:** The evidence for MI’s use in DM is inconclusive, with mixed findings reported in studies. MI had a positive trend for producing better glycemic control and better patient perceptions and adherence to prescribed regimen of exercise/ physical activity.

Keywords: Behavioral counselling; Lifestyle modification; Metabolic syndrome; biopsychosocial model.

Introduction

“The metabolic syndrome (MetS) is a cluster of metabolic abnormalities including abdominal obesity, glucose intolerance, hypertension and dyslipidaemia and is associated with an increased risk of vascular events”. [1] Diabetes mellitus (DM) had long been historically regarded as a metabolic disorder of glycemic control that presented with impaired glucose tolerance in response to activity-induced demands. [2]

The major categories of diabetes are: insulin-

dependent DM, type I or IDDM; noninsulin-dependent DM, type II or NIDDM; secondary DM or type S; impaired glucose tolerance, IGT; gestational diabetes; and previous abnormality of glucose tolerance, PrevAGT. [3] Recent trends and developments in the definition and characteristics of DM warranted a holistic approach addressing biological, psychological and social aspects of the disease. [4]

The ensuing paradigm warranted a shift towards biopsychosocial (BPS) understanding of DM related to life experience that was mediated by genetic, neurophysiological, endocrine, immune, and psychological functions. ⁵ The psychosocial variables considerably influencing a practitioner’s care for a diabetic patient were stressful life events, social support and the patient’s locus of control, [6] which were shown to be associated both with short-term and long-term glycemic control measures and were predictive of diabetes-related morbidity. [7]

The association between biological (glycosylated hemoglobin levels) and

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psychosocial (level of education, marital status, coping style) factors influences the stress, coping and regimen adherence in both type-1 and type-2 DM patients.[8] Incorporation of ecology, history and political economy into the BPS model in DM was demonstrated also by the influence of ecological destruction, population displacement and economic dependency on weight gain, altered metabolism and diabetes.[9]

Job-related stress such as job burnout was related to positive effect, level of HbA1c, stress from diabetes and health-to-work conflict which indicated that work-related burnout and stress occurred as a result of BPS interaction in Koreans with DM.[10] This influence was further extensively demonstrated in terms of social/interpersonal factors such as dyadic adjustment, interpersonal sensitivity and social functioning, and expressed emotion associated with HbA1c and pro-inflammatory cytokines (TNF-, IL-1ra, IL-17, IL-1ra, IL-2r, IL-6, and eotaxin).[11]

Chronic care model for dealing with BPS aspects of DM includes not only the biological factors for cause of illness and impact of illness on the body but also psychosocial components of patient experiences and its social impact.[12] The best-practice diabetes care integrates the chronic care model to individualize the BPS approach through a multidisciplinary primary care team.[13]

Motivational interviewing (MI) is one such biopsychosocial strategy aimed at implementing health-related behavioral modification through counseling in a provider-client interaction in healthcare.[14] MI facilitates a shared informed clinical decision making process[15] by enhancing patient's autonomous decision making,[16] in order to improve adherence,[17] facilitate behavior change,[18] motivate and empower patients in healthcare and wellbeing.[19,20]

MI was considered as a novel intervention for translating research findings into routine practice in an era of evidence-informed diabetes care.[21] The objective of this study was to evaluate the evidence for use of MI in people with DM.

Methodology

A systematic review was performed using search terms, "motivational interviewing" [Title] AND (diabetes [Title] OR diabetic [Title]) with activated filters for abstract available articles published in English language, to identify studies which were descriptively categorized under prevention and treatment of DM. Two testers independently performed search using the search strategy and scrutinized selected citations based upon their title, abstract and full text to include them for data extraction and synthesis.

Results

Of the 27 included studies, there was one study on prevention, 21 studies on treatment (effects of treatment=15; patient perceptions=6) and five studies on professional education.

Prevention

Carino *et al*[22] opined on the usefulness of MI in targeting at-risk pre-diabetes clients through therapeutic lifestyle change since it was shown to be effective in counselling clients toward behavior change.

Treatment

Effects of treatment using MI

Channon *et al*[23] evaluated the impact of MI on glycaemic control, wellbeing, and self-care of 22 adolescents with diabetes and found decreased mean HbA1c, fear of hypoglycaemia compared to the control group.

Channon *et al*[24] examined the efficacy of motivational interviewing in 66 teenagers with type 1 diabetes who were randomly assigned to the intervention group (38) and control group (28). At 12 months post-treatment, the MI group had lower mean A1C levels, more positive well-being, improved quality of life, and differences in their personal models of

illness (all $P < 0.01$).

Chen *et al*[25] determined the effects of MI on self-management, psychological and glycemic outcomes in 250 people with T2DM who were randomly allocated into either the motivational interview group or the usual care group and found improvements in self-management, self-efficacy, quality of life, and HbA1c among people attending the MI group.

Dale *et al*[26] conducted a 3-arm RCT (125 in each arm), where 375 participants were allocated to either an intervention group with Tele care service provided by a Diabetes Specialist Nurse (DSN), or an intervention group with service provided by a peer supporter (also living with diabetes), or a control group receiving routine care. The MI intervention was studied since it had the potential to support improved self-efficacy and patient experience, improved clinical outcomes and a reduction in diabetes-related complications.

Gabbay *et al*[27] determined the adjunctive use of motivational interviewing (MI) with usual care in their 2-year randomized controlled pragmatic trial of 545 T2DM patients-usual care control (n=313) or MI (n=232).HbA1c, LDL, and diastolic BP were found to improve in both groups, with depression symptom scores being better in the intervention group.

Ismail *et al*[28] compared motivational enhancement therapy (MET) + cognitive behaviour therapy (CBT) with usual care in 106 patients, (ii) MET with usual care in 117 patients, (iii) or usual care alone in 121 patients for improving glycaemic control in a three-arm parallel randomised controlled trial of 344 T1DM patients A combination of MET and CBT was found to be useful for patients with persistent sub-optimal diabetic control.

Greaves *et al*[29] assessed the effectiveness of a low-cost MI intervention in 149 participants, to reduce the risk of diabetes through weight loss and physical activity.

The patients received either information leaflets or individual behavioural counselling using motivational interviewing techniques.

More people in the intervention group achieved the weight-loss target compared to the proportion who achieved the physical activity target.

Wang *et al*[30] compared motivational interviewing-based education (MI) on 21 subjects and structured diabetes education (SDE) on 23 subjects for improving A1C and psychosocial measures in adolescents with type 1 diabetes. The SDE group had lower adjusted mean A1C value than the MI group with no differences on any of the psychosocial measures.

Welch *et al*[31] determined whether glycemic control is improved when motivational interviewing (MI) is used with diabetes self-management education (DSME) as compared to DSME alone in 234 poorly controlled type 2 diabetes (T2DM) patients who were randomized into 4 groups: MI+DSME or DSME alone, with or without use of a computerized summary of patient self-management barriers. DSME was found to improve blood glucose control, but MI+DSME were less effective than DSME alone.

West *et al*[32] determined the efficacy of adding motivational interviewing to a behavioral weight control program by measuring weight loss outcomes and glycemic control for 217 overweight women with type 2 diabetes who were randomized to individual sessions of motivational interviewing or attention control (total of five sessions) as an adjunct to the weight control program. Women in MI group lost significantly more weight at 6 months and 18 months and this increased weight loss was mediated by enhanced adherence to the behavioral weight control program.

Stuckey *et al*[33] evaluated a model of managing type 2 DM which includes nurse case management (NCM) and motivational interviewing (MI) to foster behavior change in their RCT on 549 type 2 DM patients and found that enhanced NCM improved self-care and reduce emotional distress for patients with diabetes.

Rosenbek Minet *et al*[34] measured the

efficacy of motivational interviewing (MI) compared with usual care on changes in glycaemic control and competence of diabetes self-management in 349 patients with diabetes mellitus who were randomised to either a usual care control group or an intervention group, which received MI with usual care. The study was unable to demonstrate efficacy of MI over usual care in patients with diabetes.

Rubak *et al*[35] evaluated the effect of MI on type 2 diabetes as a target-driven intensive treatment and found improvements in metabolic status, medication adherence in group which received MI versus which did not.

Reinhardt *et al*[36] investigated the effects of phone-based lifestyle education using motivational interviewing on lifestyle change in 38 women with GDM who were randomly allocated to either the control or intervention group. Reduced total fat intake, total carbohydrate intake, and glycaemic load, and increased leisure physical activity, and improved body mass index were found as lifestyle-related variables.

Lakerveld *et al*[37] in Hoorn Prevention Study assessed the effectiveness of a primary care based lifestyle intervention to reduce the estimated risk of developing T2DM and for CVD mortality, and to motivate changes in lifestyle behaviors in 622 adults who were randomly assigned to intervention group (n=314) and they received a theory-based lifestyle intervention based on an innovative combination of motivational interviewing and problem solving treatment. The 308 people in control group received existing health brochures. The study did not find significant between-group differences at 6 or 12-months follow-up and they concluded that lifestyle intervention was not more effective than health brochures in reducing risk scores for T2DM and CVD or improving lifestyle behavior in an at-risk population.

Patient/client perceptions and/or experiences:

Dellasega *et al*[38] determined 19 T2DM patients' perceptions about a motivational interviewing (MI) intervention designed to

promote positive behavior change in their qualitative study using focus groups and found that "patient perceptions of standard care were largely negative, with several individuals describing paternalistic and demeaning attitudes. Five themes were evolved to be related to MI: Nonjudgmental Accountability, Being Heard and Responded to as a Person, Encouragement and Empowerment, Collaborative Action Planning and Goal Setting, and Coaching rather than Critiquing."

El-Mallakh *et al*[39] assessed the fidelity of MI using the MI Treatment Integrity (MITI) Scale on 18 (25%) audio-taped MI sessions, which were randomly selected from a total of 72 sessions with 26 participants. The evaluations suggested sufficient content of MI to promote satisfactory interventionist fidelity.

Ridge *et al*[40] elicited the barriers and motivators to better diabetes self-care in 47 patients with Type 1 diabetes. "Four major themes emerged: emotions of living with Type 1 diabetes, perceived barriers to diabetes management, motivators for change and methods of coping. Increased assistance and support from family and healthcare teams, the prospect of improved emotional and physical well-being and feelings of success were described as factors that might motivate participants to practice more effective self-care."

Rosenbek Minet *et al*[41] conducted seven focus group interviews, each comprising 3 to 5 participants with type 1 or type 2 diabetes and on phenomenological analysis found three main themes concerning diabetes self-management: becoming a self-regulating practitioner, managing the rules of self-management, and creating a supportive social network.

Miller *et al*[42] conducted four moderator-led focus groups followed by a comprehensive content analysis based on grounded theory and evaluated MI perceptions among rural African American women with type 2 diabetes before a physical activity intervention."Patients regarded the MI consultation as an effective health

communication but the patient-centeredness of the approach was negatively perceived.”

Professional education/training

van Eijk-Hustings *et al*[43] examined the uptake of MI in daily practice by health care professionals in a care management initiative for patients with diabetes by measuring objectively (MITI) and subjectively (questionnaire). In focus interviews on MI-trained professionals (n=10) and MI untrained professionals (n=10) who were asked about facilitators and barriers for implementation. Spirit of MI was present among professionals directly after the training and increased during follow-up. Mostly uncomplicated techniques were applied. Professionals stated the need for training and practice to be able to apply more complicated techniques.

Rubak *et al*[44] examined whether training GPs in motivational interviewing (MI) improved type 2 diabetic patients’ (1) understanding of diabetes, (2) beliefs regarding prevention and treatment, and (3) motivation for behaviour change in their randomized controlled trial of 65 GPs and 265 type 2 diabetic patients. Patients in the intervention group were found to be more autonomous and motivated in their inclination to change behaviour, more conscious of the importance of controlling their diabetes, and had better understanding of the possibility of preventing complications.

Gabbay *et al*[45] suggested that Podiatrists were the ideal providers to engage in a brief behavioral intervention such as Motivational interviewing since it is a well-accepted, evidence-based teachable approach that enhances self-efficacy and increases intrinsic motivation for change and adherence to treatment and self-care methods.

Heinrich *et al*[46] assessed the effects of a Motivational Interviewing (MI) based counselling training for nurses on clinical, behavioural and process outcomes among diabetes type 2 patients in a RCT that involved 33 nurses and 584 patients participated. “Favorable effects on chance locus of control

and knowledge were found with no effects found on vegetable or fruit intake, physical activity, HbA1c, weight, blood pressure, total cholesterol, LDL, triglycerides, health care climate, quality of life or on self-efficacy.”

Jansink *et al*[47] compared MI skills of trained versus non-trained general practice nurses in diabetes consultations in improving clinical parameters, lifestyle, patients’ readiness to change lifestyle, and quality of life. Overall, performing MI skills during consultation increases, if there is more time, more lifestyle discussion, and the patients show more readiness to change.

Jansink *et al*[48] in their cluster, randomized, controlled trial involving 70 general practices (35 practices in the intervention arm and 35 in the control arm) evaluated the effects of the nurses’ training on patient outcomes. This ongoing study evaluated the implementation and sustainability of motivating and involving patients in day-to-day diabetes care in general practice.

Discussion

This study aimed at evaluating evidence for use of MI in DM from studies on prevention and treatment. The existing evidence was insufficient and inconclusive to provide recommendations.

Previous systematic review by Rubak *et al*[49] found that “MI had clinically important effects on body mass index, total blood cholesterol, systolic blood pressure, blood alcohol concentration and standard ethanol content, while combined effect estimates for cigarettes per day and for HbA(1c) were not significant.”

Previous systematic reviews had established evidence for MI in alcohol abuse,[50] cardiovascular disorders,[51] eating disorders,[52] HIV/AIDS,[53] musculoskeletal disorders,[54,55] and smoking abuse.[56] The present study is the first one on DM.

Theoretically, MI and self-determination theory work hand-in-hand by meeting in the

middle[57] which Deci and Ryan[58] clarified as: “the dimension of autonomy versus control was conceptually orthogonal to the dimension of independence versus dependence, and they emphasized that autonomy or volition, not independence, was the important antecedent of effective change.”

Practice-related implications for MI are considered worthwhile and it is thus essential to explore the active ingredients of MI in order to identify the response-specific mechanisms of change that influence and determine a change in health-related behavior.[59] Pirlott *et al*[60] listed the mechanisms of MI in health promotion as follows; “Counsellors’ global spirit, empathy, and direction and MI-consistent behavioral counts (e.g., reflections, open questions, affirmations, emphasize control) correlated with client change talk utterances and also with their fruit and vegetable intake increase. Total client change talk mediated the relationship between counsellor’s skills – MI-consistent behaviors, MI spirit and increased fruit and vegetable consumption.”

Resnicow and McMaster[61] explained a three-phase model on WHY to HOW framework for using MI: “MI had been defined as person-centered method of guiding to elicit and strengthen personal motivation for change. Core clinical strategies include, e.g., reflective listening and eliciting change talk. MI encourages individuals to work through their ambivalence about behavior change and to explore discrepancy between their current behavior and broader life goals and values.” MI thus plays an integral role in behavioral nutrition, physical activity and health.[62]

MI had been found effective for helping patients with multiple chronic conditions, adherence issues, and lifestyle issues change their health behaviors.[63] However, the mixed findings evidenced in included studies pose an important question, “Does MI improve outcomes?”[64]

Education-related implications for MI should identify the healthcare providers and students’ occupational, educational, and verbal-cognitive characteristics and MI skills

as listed by Carpenter *et al*[65] as follows; “Baseline MI skills acted as a significant predictor and clinician characteristics were associated with MI Spirit and reflective listening skill throughout training and moderated the effect of post-workshop supervision method on MI skill.” A strong interdisciplinary focus is essential for improving training in MI.[66]

Considering the growing demand for application of MI, there is a huge necessity for improving training methods in MI.⁶⁷The most commonly addressed training elements were basic MI skills, the MI spirit, recognizing and reinforcing change talk, and rolling with resistance[68] the area yet to be explored in field of diabetes research and care.

Research on MI had identified three constructs as found by Apodaca and Longabaugh:[69] “client change talk/intention (related to better outcomes); client experience of discrepancy (related to better outcomes); and therapist MI-Inconsistent behavior (related to worse outcomes).” Martins and McNeil[70] found that MI was effective on all health domains of diet, exercise, diabetes and oral health.

Levensky *et al*[71] regarded “Motivational interviewing as an evidenced-based counselling approach that health care providers could use to help patients adhere to treatment recommendations. MI emphasized using a directive, patient-centered style of interaction to promote behavioral change by helping patients explore and resolve ambivalence.” There is a need to develop diabetes-specific MI supervision and training scale,[72] and diabetes-specific MI treatment integrity code[73] for evaluating training and practice of MI respectively.

“MI emphasizes two specific active components: a relational component focused on empathy and the interpersonal spirit of MI, and a technical component involving the differential evocation and reinforcement of client change talk”. [74] Miller and Rollnick[75] listed 10 things that MI is not: “(1) the transtheoretical model of change; (2) a way of

tricking people into doing what you want them to do; (3) a technique; (4) decisional balance; (5) assessment feedback; (6) cognitive-behavior therapy; (7) client-centered therapy; (8) easy to learn; (9) practice as usual; and (10) a panacea.”

“Motivational interviewing is not about a set of techniques and questions; it is about creating a climate that facilitates change; it is more about listening than telling, evoking rather than instilling” –*Sim et al.*[76]

Understanding the social context behind MI is essentially the need of the hour, if healthcare providers owe professional and social responsibility in welfare and management of public health[77] in diabetes practice.[78]

Conclusion

The evidence for using MI for preventing and treating DM is insufficient and inconclusive to provide recommendations, and there is a trend towards positive effect on glycemic control, which was influenced by ethnicity and psychosocial context.

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