Original Article

Mechanism of Changes within Motivational Interviewing in Relation to Dietary Behavior Outcome of Diabetics Patients in Thailand

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Background: For diabetics, healthy eating or dietary management is essential. Motivational interviewing (MI) is found to be effective for facilitating Thai clients with diabetics to change their dietary behavior. At present, little is known about what therapeutic processes and mechanisms improvements occur within MI.

Objective: To explain the mechanism within MI in relation to dietary behavior outcome.

Materials and Methods: The present study was a qualitative study that explored mechanism of change within the MI program conducted in diabetic clients and use the self-determination theory (SDT) as a lens to explore the mechanism of change within MI. A qualitative approach was adopted in the present study.

Results: The mechanisms that influenced the change in dietary control of the diabetic clients were the patient perception of competence, a sense of autonomy, and therapist-patient relationship. These three kinds of perceptions are found to be related to therapist's skills and techniques used in the MI program.

Conclusion: The present study result reveals the most promising mechanisms of MI is the patient perception of competence, sense of autonomy, and therapist-patient relationship. There is a need to ensure that a relational ingredient of MI focused on empathy and the interpersonal spirit of MI will be employed by MI counselor consistently. MI self-supervision tool might be a good option to assist MI counselors adhere to MI spirit.

Keywords: Motivational interviewing program; Diabetes clients; Diet behavior

Received 7 March 2022 | Revised 2 May 2022 | Accepted 10 May 2022

J Med Assoc Thai 2022;105(7):623-30

Website: http://www.jmatonline.com

For diabetic clients, healthy lifestyle management such as diet regulation is crucial for maintaining blood glucose levels within a healthy range and avoiding diabetic complications. The difference in the attitudes and knowledge regarding the severity of diabetes mellitus (DM) between the client and the healthcare personnel has resulted in a visible gap when the former does not follow healthcare advice given. The aforementioned factors have necessitated an effective intervention for people with DM to help modify their behavior by eliciting intrinsic motivation consistent with their settings. A successful communication intervention between healthcare personnel and clients based on client-centered counseling is anticipated to be useful for such purposes.

Motivational interviewing (MI) is a kind of intervention that addresses two specific components, namely a relational ingredient involving empathy and the interpersonal spirit, and a technical ingredient focused on resolving ambivalence by eliciting a patient's personal motivation for change and reinforcement[(1)]. Clients are also encouraged to express their feelings, thoughts, and views on the actions and behaviors contributing to motivation and the desire to change their behavioral patterns concerning diet and exercise[(2)]. Diabetic clients who can regulate their blood sugar levels are shown to be intrinsically motivated by the activities, resulting in

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How to cite this article:

Yoadsomsuay P, Phukao D, Pangma A. Mechanism of Changes within Motivational Interviewing in Relation to Dietary Behavior Outcome of Diabetics Patients in Thailand. J Med Assoc Thai 2022;105:623-30.

DOI: 10.35755/jmedassocthai.2022.07.13346

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perceived self-efficacy and autonomy[3].

In Thailand, studies have investigated the effectiveness of MI on diet control in people with DM[4-11]. At present, MI is considered one of the most effective interventions for Thai people with DM. However, little is known about its action mechanisms or how its therapeutic effect is exerted on Thai DM clients receiving MI. The existing literature on MI shows how and why changes occurring in MI are less precise, identifying the process of change as a priority for the further development of psychological interventions. These findings may be consistent with the initial intervention insights acquired, eventually developing into clinical practices, and hypotheses on possible theoretical underpinning.

The present study was the first attempt in Thailand to provide meaningful insights to those undertaking preliminary work that could potentially enrich and inform a larger scale of study to explore the mechanisms of action for MI in Thai DM clients. Furthermore, Copeland[12] asserted the need for theory testing to explore the different causal pathways within psychological interventions, including MI. However, so far, few studies have been conducted in other countries using a well-established theory as a lens to explore the mechanism of change within MI. Therefore, the present study was conducted with the aim of bridging this gap.

MI is essentially grounded in Rogers' client-centered counseling approach. In addition, Miller, a founder of MI, described MI as being predicated on implicit principles derived from his intuitive practices[13]. Miller further affirmed some psychological theories involved with his MI conceptual approach, namely, self-efficacy theory[14], self-perception theory[15], and reactance theory[16]. In terms of processes or mechanisms of change, eliciting the intrinsic motivation of clients by fulfilling their basic psychological needs is one of the fundamental concepts hypothesized to explain MI's effectiveness. A psychological theory consistent with previous descriptions is self-determination theory (SDT)[17].

SDT is used to explain psychological mechanisms influencing different behavioral changes caused by the influence of various motivating elements. It is composed of two psychological constructs. First, three basic psychological needs are essential for motivating behavioral changes, and they are competence, relatedness, and autonomy. Second, an increase in motivation can occur through different forms of behavioral regulations, stimulating the transformation of extrinsic motivation into intrinsic. The level of intrinsic motivation is based on the reasoning of internal interests, happiness, or satisfaction, while extrinsic motivation includes external stimuli, putting individuals under pressure in their behavior. Therefore, the level of motivation can be altered in accordance with the various reasoning and goals stimulating different behaviors.

Miller[18] hypothesized that when inconsistencies are elicited in MI, the client does not, in fact, experience a motivational drive to achieve consistency, as predicted by cognitive dissonance. Instead, it is proposed that a discrepancy between behavior, goals, and values directly facilitates the elicitation of ambivalence toward changing behavior, so that larger discrepancies have greater importance.

The present study was the first attempt in Thailand to explore mechanisms by which MI could influence health behavior. SDT was used in the present study to explain the mechanisms that motivate the changes leading to diet control behavior. The findings of the present study could be used to demonstrate the causality between change in the mediator and an increase in change talk linked to a change in diet control behavior. It is argued that viewing MI from the perspective of SDT will help in achieving a greater understanding of the associated processes, informing future developments of MI methods and applications. Therefore, exploring the underlying mechanisms of change in Thai DM clients receiving MI could help connect theory with practice by identifying the key therapeutic processes transcending the diversity of models, approaches, and techniques employed across service settings and socio-cultural contexts.

Objective

The present study had been conducted with the objective of exploring the mechanisms of changes integral to MI, which aimed at improving dietary behavior.

Materials and Methods

The present study section summarized the one-group experimental research case study on the efficacy of MI for people with DM[19]. It also described the methods used in the current mechanism of change to explore how change talk was expressed through SDT as an underlying mechanism of change in MI.

Research design

The scope of the present study was limited to eight volunteers between the ages of 54 and 63 years who completed a group experimental research

case study on the effectiveness of MI for diabetic clients. Recruitment of these volunteers lasted for a maximum of six months and ended when either eight volunteers were recruited, or six months had passed. Each volunteer was asked to attend interview sessions to explore mechanisms by which MI could influence dietary control outcomes. The present study was conducted at the Bueng Phra Ajarn Sub-district Health Promoting Hospital in Phra Ajarn Sub-district, Ong Kharak District, Nakhon Nayok Province. This area was particularly selected since it has the highest number of diabetic clients.

To attain a comprehensive understanding of how DM clients view change talk relating to altering their dietary behavior, a qualitative approach was adopted in the present study. Qualitative approaches captured the range of influences on change talk relating to a client's dietary behavior and offer an in-depth perspective on individuals' perceptions that may help identify the mechanisms/processes involved in change talk within the dietary domain. The present qualitative study had important implications for the development of future, more effective MI interventions and provides detailed information on the views of individuals participating in such trials or experimental research, frequently undocumented in traditional approaches. The interviews were conducted by a researcher who was not involved in the care of the clients.

Summary of the primary empirical study

The present study was executed in three phases, intervention development (phase 1), evaluation of the MI intervention efficacy (phase 2), and mechanism of change (phase 3). As stated earlier, the present study was conducted with the aim of providing fundamental guidance for studies conducted to identify potential causal mechanisms of the MI.

The one-group experimental research case study on the efficacy of MI for Thai diabetic clients was conducted in phase 2. The eight participants who voluntarily joined the MI program in phase 2 were diabetic clients 1) diagnosed by a physician with type 2 DM, aged 18 years or above with a three-month history of high blood glucose levels 126 mg/dL^2 or more, 2) agreed to join the MI program and willing to provide in-depth diet information for blood glucose management, and 3) not ready to change their diet management or ambivalent about it.

The MI program employed in the present study included counseling sessions aimed at motivating clients to change their behavior, identifying, and resolving ambivalence concerning behavioral changes, and eliciting their own potential change capability and self-efficacy in diet control.

The key to effective MI lied in the role of the counselor or program operator in encouraging the clients to discuss the issues as if they were talking to themselves and eventually realizing that they were having problems, resulting in the client's argument for change. Using MI principles and OARS techniques such as open-ended questions, affirming, reflective listening, and summarizing, clients were encouraged to think and speak out the self-motivation statement (SMS), reflecting their desire for behavioral change.

To prepare for the MI program, the researcher acted as the program's counselor, underwent a special workshop using the knowledge acquired to plan and execute the program and the interview process to identify the mechanisms of change taking place. The MI program was conducted under the supervision of an MI expert who is a member of Motivation Interviewing Network of Trainers (MINT). In addition, the researcher had to complete the MI self-supervision tool after running each MI session.

All the MI sessions in the program were conducted one-on-one, wherein the counselor interacted with the diabetic clients or participants, before beginning the interview and tried to understand their behavior. The interview proceeded by conducting in-depth interviews with non-participating observation on the patient's motivation for diet control.

The MI program consisted of 45 to 60-minute sessions, conducted once a week for four weeks. All behavioral changes in participants were recorded throughout the program. Each participant's attitudes, perceptions, emotions, and feelings regarding to their own diet behavior were included in the data.

Each participant's interpretations and perceptions of changes in behavior were examined individually during data analysis. The researcher rechecked the data using the triangulation method at the end of each interview session by closely observing each participant and conducting an additional interview with their family members or caregivers to confirm the participant's eating or dietary behavior, improve data quality, and monitor data reliability.

The eight diabetic clients participating in the MI program were aged between 54 to 63 years, had DM between 1 to 10 years, and one was male and the other seven were females. Each participant had a different level of readiness for diet control. Most of them in the contemplation stage realized the benefits of behavioral change yet remained concerned about obstacles involved, resulting in ambivalence,

behavioral procrastination, and reluctance to change.

After participating in the MI sessions, the diabetic clients became more aware of their difficulties and began to set goals for themselves by selecting techniques aligned with their individual needs and lifestyles. As a result of the MI sessions, the participants expressed change talk that indicated their intention to diet as well as a positive attitude toward diet control. The following statements expressed change talk, evoked in accordance with their motivation. Statements given by some of the participants were as follows:

"I am afraid I will need more medication and have kidney problems if my blood sugar is high." (female, 59 years).

"I will try to decrease it. My sugar level once came down from 150 to 135. I think I can do it again." (female, 61 years).

"The doctor gave me a suggestion regarding diet control. I think I can do it. I have to reduce sweets, fruits, and snacks." (male, 54 years).

"When I see my doctor next time, I do not want my blood sugar to be higher. So, I will eat less rice and drink lots of water. I will be full eventually." (female, 63 years).

From the above statements, it could be interpreted that once the intention to modify the behavior was stated by the clients, food intake regulation would follow. The clients exhibited an increase in self-regulating behavior, which focuses on the kind of food they were going to consume and how it affected their blood sugar levels.

Data collection

Qualitative data were collected through in-depth interviews conducted by one of the researchers. In-depth interviews were used to collect data for the study and included questions prepared in accordance with the MI program and SDT, validated by specialists in disciplines of psychology, health, and health social sciences. The in-depth interview guideline was designed by considering the following issues or main themes:

a. The extent to which constructs related to the satisfaction of three basic psychological needs as relatedness, competence, and autonomy, expressed by participants.

b. The extent to which constructs related to participants verbally arguing for change or engaging in change talk was related to their behavioral change, arising from the personal goals and values they expressed.

c. Whether other expressions pertinent to the process of change but not related to any constructs of SDT were also observed.

Data collections were conducted between December 2017 and May 2018. The convenience and availability of the participants were used to choose the times and locations for interview appointments. During the in-depth interview process, the data were recorded using a note taker and audio recorder. The in-depth interviews lasted between 30 and 60 minutes. The participants were asked the same questions, and debriefings was conducted the same way. Some of the unclear keywords in the participants' answers were rechecked and put to them again after each interview to increase data consistency.

Data analysis

The transcript was recorded completely and double-checked after each interview. The content analysis began with a word count and was expanded to identify latent meanings and themes. In addition, two trained coders double-checked the coding process. After that, thematic analysis was performed and discussed by the researchers using coding tree and theme derivation, which took the following form in the present study:

- The thematic analysis was theory-led, guided by SDT. In such a thematic analysis, the researcher started with hypotheses based on a theory of what may occur in the data, subsequently formulating indicators for evidence that may corroborate this theory.
- A semantic approach was employed whereby the explicit level meaning of the data was used to identify themes.
- The SDT literature was used to guide the next interpretive level of analysis with the aim of inferring the broader meanings and implications of the themes identified.

In conclusion, following each interview session until data-saturation, the data were analyzed and explained to create themes and compare them to the SDT and MI programs.

Ethical considerations

The present research had been approved by the Committee for Research Ethics (Social Science), Mahidol University, No. MU-SSIRB 2017/237.2811. All participants were informed and guaranteed confidentiality. They were also given the freedom to decide whether to take part in the study. Informed consent was given by every participant before commencement of the study.

Results

Participant background characteristics

All participants in phase 2 of the present study also agreed to take part in phase 3. The eight diabetic clients participating in the MI program were aged between 54 and 63 years and in farming and general employment.

Mechanisms of change underpinning motivation

Three main findings were identified from the accounts of participants and counselors in accordance with SDT mechanisms (deductive themes).

Autonomy construct themes:

According to MI, exchanging information and addressing the needs of clients is essential. This could be accomplished by allowing individuals to choose their own diet plan and offering help in setting objectives and making decisions to improve their diet behavior.

MI counselor: "From what I have heard, you have good and bad experiences from drinking coffee. For example, you said that coffee helps you feel less tired. You are also aware that drinking coffee can raise your blood sugar. What do you make of that? What are you going to do next? What is your next step?"

Participant C: "Well, thanks for not forcing me to change. I appreciate this, it makes me feel good. You know, people around me or most doctors I have met force or beg me to change. I know they all worry about me, but I really feel uncomfortable."

In addition, the MI counselor had many conversations with participants in an attempt to encourage them to experience the freedom of deciding their own healthcare. The following are examples of the participants' statements on food planning in accordance with their abilities.

Participant D (male, 55 years): "Our children like fried dishes, so my wife has to make fried pork and fish for them. I usually eat those dishes too, just a little bit. If she had to make steamed fish especially for me, it would be hard for her. So, I usually eat more of the vegetables with a chili paste side-dish."

Competence construct themes:

i) Perception of self-efficacy in changing diet control

The MI counselor assured the participants that the process could be completed successfully by discussing both positive and negative health experiences as a technique for exploring and enhancing self-efficacy. This provided the participants with the opportunity to choose a suitable solution in accordance with their level of readiness, such as when they became aware of and accepted their own concerns. It was an important motivator in the behavioral change process, as shown in the following example:

MI Counselor: "It seems you have a strong mind, like when you said you did not want your blood sugar to rise?" Could you please tell me more about how are you going to achieve this?

Participant E: "I am pretty sure, doctor. I have done this kind of thing, and it is not my first time. Let me tell you more how...."

MI counselor: "After we have discussed your previous experiences relating to the thinking and action strategies you have used to control your diet successfully, please tell me how much do you rate yourself from 0 to 10. Zero means you are not confident at all in the dietary goal you have set, and 10 means you are very confident in your dietary goal."

Client F: "Thanks, doctor. I feel more confident when talking about my previous success. I think that right now, I rate myself 7 out of 10. You know, the first time we met, if you asked me the same question, I might have rated myself around 3 to 4."

ii) Recognizing that they have the ability to control their diet

"My doctor offered ideas relating to what food I should eat, and I believed I could do so by limiting sweet fruits and sweets." (female, 55 years)

"I try to drink my coffee bitter, not too sweet because I know that I should." (female, 57 years)

iii) Willingness to change behavior

The participants made specific and feasible behavioral change plans in line with their lifestyles and needs as a result of engagement and supporting information in decision-making. They showed that appropriate healthcare behavior depended on their own abilities. As a result, participation provided an incentive to engage in the appropriate behaviors on an everyday basis.

Relatedness construct themes:

Clients were more motivated by the MI program counselor's expressions of understanding based on their associated behaviors and factors, as well as the counselor's affirmations and encouragement.

This was the key principle of the MI process, whereby effective listening skills were used to understand the patient's feelings without judging, criticizing, or blaming another person. This assisted in understanding the clients' concerns, which might affect their motivation to change behavior, as shown in the following example statements:

MI Counselor: "When you said you eat everything your wife cooks for you, it seems you are a non-picky

eater, and the underlying meaning is that you love your wife and want her to be happy because she told you she is really happy when you eat everything that she cooks. So, your wife's happiness is very important to you. Are there any things that might not be as good which could affect your wife's happiness in the long term if you always eat everything she cooks?"

Participant A: "Oh, doctor, you know my mind. I appreciate you paying such great attention to my story. Yes, I really love my wife. I want her to be happy. So, I do everything that I can to make her happy. Yes, you are right. I never thought about what could happen to us both if I keep eating everything she cooks."

MI Counselor: "Being faced with a big decision can be overwhelming. What I have heard from you is that you seem confident about making this big decision to keep your diet within control because you do not want your blood sugar to rise."

Participant B: "Exactly, doctor. It is very hard for me, you know. I have a sweet tooth and like to eat all sweet things. It is so depressing having to make a decision like this. But you know, I cannot carry on like this anymore. Something has to stop."

Discussion

As noted earlier, this is the first study conducted in Thailand aimed at investigating the mechanisms of action for Thai DM clients receiving MI, specifically, how intrinsic motivation based on SDT and its associated constructs is expressed in MI sessions and the treatment of DM. This dietary behavior outcome reflects the participants' change talk expressions about changing their dietary behavior. The researchers unraveled the MI intervention using active ingredients such as counselor and client factors, and mechanisms of change. The findings of the present study help to explain MI at work. It offers a view on how the counselor acts to influence the client's behavior, activating the client factors that may sometimes stimulate the occurrence of mechanisms of change. These are covert assumed psychological processes associated with change talk expression in relation to the client's dietary behavior.

The results of the present study are consistent with the existing evidence that the satisfaction of psychological needs is the mechanism of change underpinning the MI component. Qualitative evidence shows that the MI techniques support the three basic psychological needs.

In the present study, the counselors supported the participants' autonomy by eliciting their perspectives, asking about previous experiences of behavioral change, and using open-ended questions. Relevant behavior change goals were set between counselors and participants.

In terms of relatedness, the results of the present study are consistent with those of Sara and Martin[20], who explored the experiences of diet and exercise behavior in obese clients through the MI process. They found that attention and support from counselors were critical for driving behavioral changes because clients were aware of their empathy and willingness to help. Practitioners taking the time to really listen to participants supported the latter's need for relatedness. According to a qualitative systematic review by Dwarswaard et al[21], relational support lays the foundation to address other needs. Previous research has found a link between MI and SDT constructs, focusing on increasing physical activity[20].

In terms of competence, the participants' need to acknowledge their own competence in various activities helped them to recognize their self-efficacy in solving problems. This allowed the participants to observe themselves truthfully and set goals. Motivating the participants to have expectations and designated goals to deal with problems was an important mechanism for encouraging them to change their dietary behavior. It also promoted the participants' self-esteem and acknowledged their self-efficacy in diet control. The collaboration between the MI program counselor and the clients in planning and finding ways to change their behavior according to the potential and context of their lives[22] is consistent with the study by Dellasega et al[23] who studied the response of diabetic clients to investigate how they felt about the MI program. They found that MI encouraged the clients to take responsibility for their own health and lifestyle changes that met their needs. In addition, they received encouragement as well as empowerment from guidance rather than criticism, which was different from the usual treatment in which the doctor would relay the behaviors required in taking care of oneself. In addition to the principles, the techniques and skills used in the MI program were the key components linking the mechanisms affecting the change in attitude and motivation, resulting in the diet control behavior of the clients.

Another interesting finding from the present study is that clients verbally arguing for change or engaging in change talk was related to their behavior change arising from "feeling guilty toward their doctors" apart from the personal goals and values expressed by some clients. Most clients expressed

that gratitude and acceptance underpinned the feeling of guilt toward their doctors, which are two essential values. Interactions between Thai clients and their doctor resulted in discrepancies between the former's values relating to acceptance and gratitude, and existing dietary behavior. In addition, the clients expressed that the key catalyst for them beginning a dietary change was the fear of being reprimanded by their doctor. This relationship increased the clients' motivation to change behavior, even though it originated from feeling guilty, which is accepted as an introjected motivation. Introjected regulation is considered to relate to extrinsic motivation. People adapt to a certain routine of behavior to please others or even themselves, assuming it will bring about positive incentives. There is a feeling of guilt when this is not the case. There are pressures and a sense of obligation toward the outside world and the guilt takes over in this type of motivation[17]. The findings of the present study also reveal that after clients changed their diet for a while and realized they were capable of doing it, the change positively affected their health, and the clients then practiced the changed behavior continuously.

Conclusion

The mechanisms influencing the change in readiness for behavioral adjustment and the level of motivation in dietary control of the diabetic clients were the clients' perceived relatedness, competence, autonomy through the counselor's skills, and the techniques used in the MI program. This was the result of a collaboration between the MI counselor and clients, providing freedom in making decisions about their own behavior, allowing the clients to receive basic psychological needs such as i) independence in determining behavior, as well as the encouragement to be aware of their own ability to act and behave according to their own context. This is consistent with autonomy in SDT, which is related to people's need to feel volitional in their actions rather than feeling controlled, ii) relatedness involves the need for meaningful social connection, which is often integrated into MI through the relationship established with an empathetic, nonjudgmental counselor, and iii) competence, which describes people's confidence in their ability to execute change.

Therefore, the format of an MI program for diet control in diabetic clients should focus on MI spirit to facilitate the clients' perceptions of relatedness, competence, and autonomy in accordance with their background. In addition, there is a need to ensure that adherence to MI spirit is employed consistently by MI counselors. MI self-supervision tools might be employed to prevent the spirit of the MI approach from being violated.

In addition, the results relating to the key catalyst for clients beginning the dietary change due to the fear of being reprimanded by their doctor, underpinning their values of gratitude and acceptance, should be brought to the attention of doctors to ensure the appropriate intervention is received.

The limitation of the present study is that the mechanism of change is associated with the short-term outcome of change talk statements by the clients after participating in the MI program. Future research might focus on exploring the mechanism for change appearing in the dietary behavior associated with more long-term outcomes. Furthermore, only a small sample of eight patients were studied. However, the researchers believe that the sample was pragmatic and population-based, and in their opinion, represents DM patients. The tentative model in the present study is based on MI theory and research literature and thus reflects the current state of the MI knowledge on this subject.

Recommendation

The format of an MI program for diet management in Thai diabetic clients should address on MI spirit to encourage the clients' perceptions of relatedness, competence, and autonomy in accordance with their background. In addition, there is a need to ensure that MI spirit is adhered consistently by MI counselors. MI self-supervision tools should be employed to prevent the spirit of the MI approach from being violated.

What is already known on this topic?

MI is found to be effective for clients with DM in Thailand. At present, little is known about improvements in the processes and mechanisms occurring in MI.

What this study adds?

An important mechanism that leads clients receiving MI to change their behavior could be explained through the perspective of SDT. These SDT-relevant mechanisms create an empathetic therapeutic relationship, allowing people with DM to be independent, and have a food control pattern according to their own abilities. The perception of relatedness, empathy, competence, and autonomy would then be expressed and linked to the change outcome.

Acknowledgement

The authors also would like to thank all participants in this study.

Conflicts of interest

The authors declare no conflict of interest.

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