

Article

The Efficacy of Motivational Interviewing with Cognitive Behavioral Treatment on Behavior Changes in Heavy Drinkers

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Abstract: This study aimed to investigate the efficacy of motivational interviewing (MI) with cognitive behavioral treatment (CBT) on behavioral changes of heavy drinkers. This study used embedded mixed methods that integrate sequential qualitative interviews with quantitative evaluation. Of a total of 47 participants, 24 belonged to an intervention group, which participated in the MI with CBT on behavioral changes once a week, 25–30 min on average, for 8 weeks. A total of 23 participants were assigned to a control group, which received a 7-page booklet containing information about alcohol. A *t*-test, generalized linear model, and qualitative analysis were used to evaluate the effects of MI with CBT. The interview data ($n = 13$) were analyzed using qualitative content analysis. There was a statistically significant change in participants' beliefs concerning the immediate effects of drinking ($F = 3.827, p = 0.025$). Additionally, the intervention group had a significantly higher drinking refusal self-efficacy than the control group ($F = 4.426, p = 0.015$). Four themes emerged from the analysis of qualitative data: reduction of benefits of drinking, changes in thoughts about costs of drinking, changes in drinking behavior, and achieving self-efficacy. The MI with CBT significantly promoted awareness of problem-drinking behaviors among heavy drinkers and increased their self-efficacy, improving their ability to make positive behavioral changes for themselves. Since this intervention is simple and easy to apply, it will be useful for problem drinking-prevention strategies in the public health sector. Therefore, efforts to disseminate these strategies will be worthwhile from sustainable perspectives.

Keywords: motivational interviewing; cognitive behavioral treatment; heavy drinker; prevention



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1. Introduction

How can we change someone's unhealthy behavior effectively from sustainable perspectives? There are various approaches to changing unhealthy behaviors such as problem drinking, smoking cessation, and obesity. Problem drinking is a global health problem that affects the disability-adjusted life year (DALY), increases the socioeconomic burden, and causes negative consequences in handling our daily life, such as physical or mental health problems, unexpected accidents, and reduced work productivity [1–5]. Since problem drinkers tend to control their drinking behavior by themselves, it may not be easy to detect and prevent these problems early. In the early stages, however, problem drinkers tend to accept positive counseling or treatment relatively easily [6–8]. Drinking problems are thus sufficiently correctable with effective “early detect and curable” intervention to change problem-drinking behaviors.

Motivational interviewing (MI) is one of the most widely disseminated and utilized evidence-based practices. MI is a collaborative communication style that improves the client's ability to strengthen their internal motivation and thus allows them to change their problem behaviors [7,9–11]. In addition, MI emphasizes a therapeutic engagement that identifies the client's ambivalence, or important values through accurate empathy

and strengthens their self-determination for behavioral change [11]. Motivation consists of internal and external motivation, of which internal motivation is the main factor that initiates a specific behavior [11–13]. MI is an intervention designed to enhance the motivation level of clients receiving treatment. Motivational intervention for prevention of heavy drinking includes feedback, responsibility, advice, menu of strategies, empathy, self-efficacy (FRAMES), awareness of discrepancies, decisional balancing exercise, and continuous monitoring, all of which are important for changing clients' problem-drinking behaviors [14–16]. Previous studies have mainly examined changes in drinking behavior after applying MI to prevent problem drinking [17]. However, it is important to evaluate the context and the process of behavior change because MI focuses on clients' thoughts of changes and processes, including therapeutic engagement.

Many studies show that combining MI and cognitive behavioral treatment (CBT) as an intervention is more effective for changes in unhealthy behaviors than providing motivational intervention only [18–22]. After the motivation for initial change is built through MI, it is necessary to help practice change behavior with CBT of action-based approaches.

Factors that promote changes in motivation depend on the improvement of cognitive-psychological indicators such as decisional balance and perceived self-efficacy of the clients [23–26]. An exploration of the benefits and costs of drinking behaviors allows clients to make decisions that facilitate behavioral change and self-efficacy that may be controlled in drinking situations, which ultimately promotes the decision to make behavioral change. Furthermore, it is more effective in sustaining and improving the behavioral changes tailored to the client's situation when providing cognitive behavioral strategies, such as cognitive restructuring, problem-solving skills, and self-monitoring [18,20,27].

The purpose of this study was to evaluate the effects of MI with CBT on variables of behavioral changes such as decisional balance, drinking refusal self-efficacy (DRSE), and drinking behavior of heavy drinkers. The hypotheses of this study are as follows: (1) MI with CBT intervention will significantly reduce the score of benefits of drinking (pros) and drinking behavior; (2) MI with CBT intervention will significantly increase the score of costs of drinking (cons) and DRSE. In addition, using an embedded design that integrates a qualitative approach with a quantitative experiment, we supplemented quantitative data with a qualitative interpretation of the context and the process of change for participants. This study will therefore provide a much clearer view of the efficacy of the MI with CBT and will help the clinical application of MI with CBT for heavy drinkers.

2. Materials and Methods

2.1. Study Design

This study examined the efficacy of MI with CBT intervention using the embedded design of qualitative research within a quantitative experiment.

2.2. Participants

Participants were eligible for this study if they were aged 20 to 55 years and had drunk alcohol within the past 3 months, had an alcohol use disorders identification test—consumption (AUDIT-C) score of 4 or higher for men [28,29], and were fluent in Korean. Those participants had not been diagnosed with alcohol use disorder (AUD) by diagnostic and statistical manual (DSM)-IV or DSM-5 criteria from psychiatrists. To estimate the number of samples required to achieve statistical significance of the study, G^* power 3.1 was used. Statistical power analysis was performed using the following: an alpha of 0.05; two-tailed test of significance; 90% power ($1-\beta$); and based on a moderate effect size (f) of 0.56, identified in a previous study [30]. Considering the attrition rate of 10% in the previous study [30], 21 participants in each group of this study required and were satisfied with the statistical significance requirement.

Participants were recruited as follows: From the 213 employees initially screened using the AUDIT-C, 141 employees with a score of 4 or higher were screened, who conducted a baseline assessment interview to identify problem-drinking behaviors. A total

of 93 people were excluded: 89 persons with less than 16 points from the AUDIT results [31,32]; 2 persons with difficulty in participation due to work restrictions; and 2 persons who did not want to participate in this study.

One of the control group members dropped out because he did not want to participate in this study without first completing the questionnaire (attrition rate of 4.2%). The final participants totaled 47 clients: 24 in the intervention group and 23 in the control group (Figure 1).

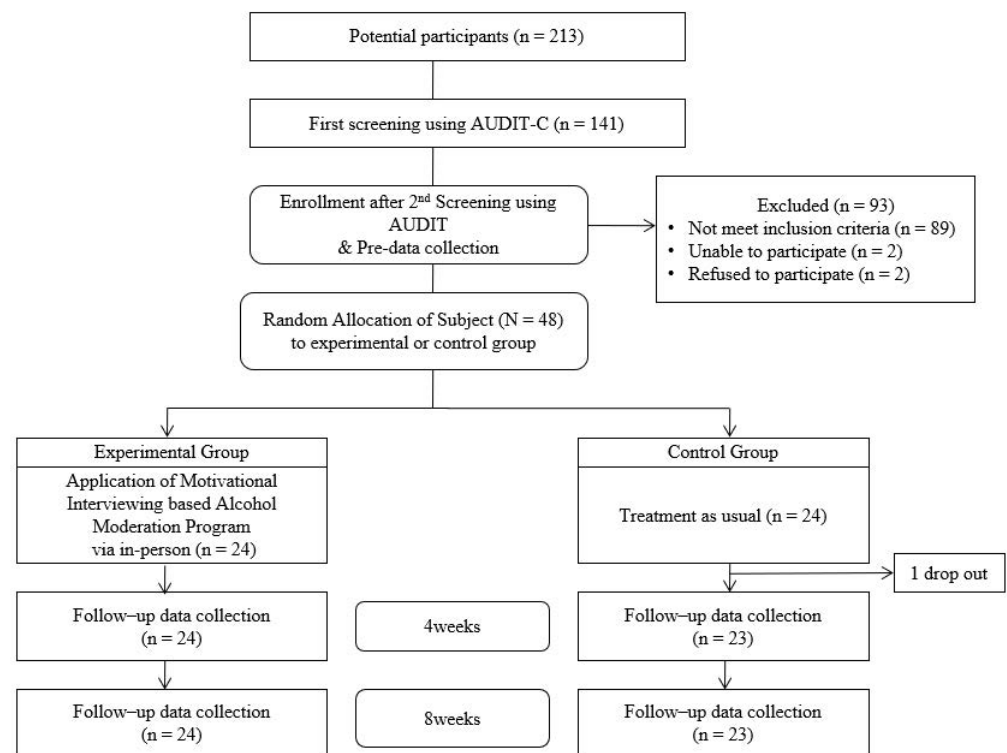


Figure 1. Recruitment of participants.

2.3. Procedures and Data Collection

This study was conducted from January to October 2015 at a workplace involving semiconductor production located in Gyeonggi province in Korea. We provided a flyer that clearly outlines basic information about this study to participants, which was approved by the executive and the safety and health manager of the workplace. All participants were informed about the MI with CBT intervention and how this study would proceed. During the allocation process, participants were randomly assigned to either the MI with CBT intervention or treatment-as-usual (TAU) by a computer-generated process using simple randomization by the statistician. The assigned randomized results were communicated to the participants individually by telephone and oral messages. An occupational safety health manager was scheduled to participate during working hours that did not overlap with the intervention and was personally notified of the attendance schedule.

The quantitative data collector of this study was blinded; thus, they did not know whether the participant belonged to the intervention group or the control group, and they did not participate in the whole process of the intervention. The data were collected by six data collectors with a master's degree or above who had received two hours of pre-training (1) before the intervention, (2) in the fourth week of the intervention, and (3) in the eighth week of the intervention, both in the intervention group and the control group. During the eight weeks of the intervention, all of the individual interview data were collected and audio-taped with the consent of the participants. After all the interventions were completed, we additionally collected qualitative data on 13 participants of the intervention

group who could describe and discuss the effects of the MI with CBT intervention in detail (Figure 2).

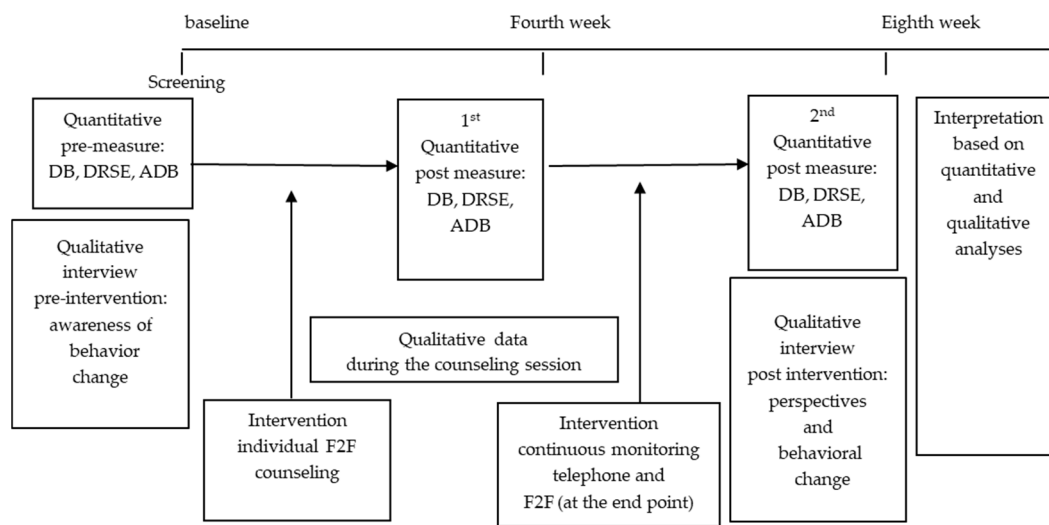


Figure 2. Procedures and data collection. DB: Decisional Balance, DRSE: Drinking Refusal Self- Efficacy, ADB: Alcohol Drinking Behavior, F2F: Face to Face.

Individual interviews in the final phase took more than 30 min in a private room. During the interview, the interviewer did not deviate from the questions, and responded only by nodding so that participants could express their experiences in their own language. The interviews were digitally recorded and transcribed verbatim by the first author. Ethical approval for this study was obtained from the Institutional Review Board of Seoul National University (Registration No. 1406/001-013).

2.4. MI with CBT as the Motivational Intervention

The MI with CBT intervention was provided as a continuous individual intervention with eight sessions according to the intervention protocol (Table 1).

Table 1. Intervention protocol for motivational interviewing (MI) with cognitive behavioral treatment (CBT).

Domain	Session	Contents	Examples of MI with CBT Intervention
Engaging	1	<ul style="list-style-type: none"> - Typical day - Comprehensive assessment of negative consequences - Drinking diary (as homework) 	<ul style="list-style-type: none"> - I am not saying that you have an unhealthy habit or that you have a drinking problem. I want to get to know you through this time. - What does a typical day look like for you? - Please tell me about your previous experiences after alcohol drinking. - Starting today, you will write a drinking diary. If you drink, write down the amount you drank. And the days when you do not drink are blank. If you have experienced a craving for drinking, mark this with a triangle.
		<ul style="list-style-type: none"> - Explore the alcohol expectancies - Decisional balance exercises - Exploring values - Review of the drinking diaries 	<ul style="list-style-type: none"> - It would have been difficult for you to fill out your drinking diaries, but thank you for taking it after writing it like this. I wonder what kinds of thoughts or feelings you had. - What can be expected if you continue alcohol drinking? I wonder what you think is the most important thing in your life. - What are the benefits (costs) of continuing your drinking behavior? What else?

Table 1. Cont.

Domain	Session	Contents	Examples of MI with CBT Intervention
Evoking	3	- Drinking social norms	- I wonder what kinds of thoughts or feelings you have while you write drinking diary.
		- Alcohol related information	- I would like to explain Korean drinking statistics and alcohol-related research data. Looking at your results of drinking behavior feedback report, where are you?
		- Personal feedback report	- Have you ever heard of the mechanisms of addiction? (elicit)
		- Evoking the change talk- Review of the drinking diaries	- The mechanism of addiction is explained by the brain's reward system (contents skip), (providing), I wonder what you think after hearing these explanations (elicit). - What are you most worried about? What do you want to do with your drinking behavior?
Planning	4	- Explore the strengths and the experiences of past success	- I wonder what kinds of thoughts or feelings you have while you write drinking diary. - What positive comments have you received from people around you so far? Think of the time when you've achieved something in your life. I'd like to talk about the experiences you've tried.
		- Alternatives of high-risk drinking	- Let's think about how you can cope with a high-risk drinking situation? Only you can make this decision. If you're okay, can I tell you some tips I know?
		- Coping strategies for behavioral self-monitoring	- What strategies can help you make a change? What are the obstacles to doing that? How can you cope? - What more do you need to prepare?
Self-care	5-7	- Self-monitoring on everyday life	- How are you going for a week? I'd love to hear your stories related to alcohol drinking over the past week.
		- Searching for solution to obstacles	- What kind of obstacles did you find? How can you do what you planned? I'm wondering if there are any coping strategies that you have come to think about. - Thank you for talking to you over the phone.
Determination	8	- Facilitate continuing lifestyle	- Thank you for meeting you again after talking on the phone.
		- Evaluate change process	- What do you want to continue in the future? What do you do to keep this change? - Thank you for being with me so far.

In the first session, participants voluntarily engaged in the comprehensive assessment of the negative consequences experienced by drinking behavior while exploring their typical day [33]. The second session explored clients' motivation for change by carefully comparing the benefits of drinking to the consequences of drinking, such as changes in drinking behavior, and were encouraged to think about the important values of life. The third session developed discrepancies found during the second session by comparing the results of individual drinking behaviors with national drinking statistics, providing alcohol-related information through the Elicit-Provide-Elicit (EPE) process [11,15]. The core elements of the third session are a normative feedback chart and a summary of the severity of alcohol problems of the participants. The fourth session established a comprehensive plan for behavioral change while discussing the positive aspects and past successes experienced by previous clients, enhancing the perceived self-efficacy of participants. From the first session to the fourth session, participants were asked to write their drinking behaviors on a self-monitoring diary as homework. Records of their drinking patterns were discussed before each session. After the fourth session, participants identified high-risk situations and established problem-solving skills to cope with them [20]. Through three phone management sessions after in-person interview sessions, the participants were monitored for obstacles to enacting moderate drinking behavior, and the process of searching for a solution for achieving the goal was confirmed. After confirmation, we terminated contact with clients, leaving them with support for continuous change behavior.

Each phone management session lasted 10 min over, and each in-person counseling session lasted an average of 36 min. In-person counseling used MI with CBT strategies such as an open-ended question, reflection, feedback, self-monitoring, and problem-solving skills with a non-judgmental, balanced attitude based on MI spirit. MI with CBT intervention was implemented by the first author, who is a member of the Motivational Interviewing Network of Trainers (MINT), having had various training sessions on CBT and experience in implementing CBT programs for people with AUD.

Seven pages of information were provided to all participants before the intervention, including the effect of alcohol on the body, blood alcohol concentration, and consequences of drinking.

2.5. Measures

This study used demographic variables (gender, age, family members, and lifestyle habits such as smoking and exercise).

2.5.1. Drinking Behavior

To measure the level of drinking behavior, three items of the AUDIT-C developed by the World Health Organization were used [29,31]. This 3-item self-report questionnaire is a 5-point Likert scale from 0 to 4, with a total score of 12 points. Higher scores suggest greater problem drinking. Cronbach's alpha of the study by Allen et al. [34] was 0.80, and for this study it was 0.83.

2.5.2. Decisional Balance

The decisional balance was measured by Maddock and developed for non-dependent drinkers [35]. The instruments used included eight pros and eight cons regarding the benefits and costs of drinking, and each question was presented through a 5-point Likert scale. The overall score of each component is 40 points, and the higher the score, the higher the decisional balance. Cronbach's alpha of the study by Maddock [35] was 0.89, and this study showed the same result.

2.5.3. Drinking Refusal Self-Efficacy

The alcohol abstinence self-efficacy (AASE) scale measured DRSE. The AASE scale was developed by Diclemente et al. for problem drinkers who do not need long-term client care [36]. The self-efficacy and self-confidence of the individuals who would not be drinking in the four categories—negative affect, positive and social situations, physical concerns, and withdrawal or urging—were measured using 20 items. Through the 5-point Likert scale, higher scores of DRSE indicated that the participant had a higher tendency to self-efficacy. Cronbach's alpha of the study by Diclemente et al. [36] was 0.92, and this study was the same.

2.6. Data Analysis

Quantitative data of this study were analyzed using IBM SPSS Statistics 23.0 for Windows. The Kolmogorov–Smirnov test was used to test for the normality of the variables, and the variables were normally distributed. The Chi-squared test, Fisher's exact test, and *t*-test were used to test the homogeneity of general characteristics and dependent variables. The collected quantitative data were analyzed by a generalized linear model and paired *t*-test. Qualitative data were analyzed using conventional content analysis [37]. While carefully reading the transcripts of interview data and the field notes, we marked contents specifically describing the effects of the intervention. These selected contents were grouped into similar ones, and organized into a hierarchical structure. Strategies for the validity and reliability of qualitative research methods such as repeated observations at the research site, cross-checking codes, and triangulation were used for data collection and analysis [38]. The qualitative data were integrated as evidence to enhance understanding of quantitative outcomes. The results of the quantitative analysis were reviewed by consulting a statistician,

and the qualitative results were reviewed by five participants and peer debriefing was performed by seven experts.

3. Results

3.1. Participants' Characteristics

There were no significant differences between the two groups in terms of the participants' characteristics relating to age, education, marital status, religion, monthly income, number of family members, smoking habit, exercise, and depressive mood (Table 2).

Table 2. Homogeneity test between the groups at baseline.

Item	Exp(n = 24) n(%) or Mean \pm SD	Con(n = 23) n(%) or Mean \pm SD	χ^2/t	<i>p</i>
Age	41.9 \pm 6.2	45.8 \pm 7.4	−1.99	0.053
Education			0.62	0.494
≤High School	20(83.3)	17(73.9)		
College≤	4(16.7)	6(26.1)		
Marital Status			1.08	0.461
With Spouse	18(75.0)	20(87.0)		
Without Spouse	6(25.0)	3(13.0)		
Religion			0.22	0.77
Yes	11(45.8)	9(39.1)		
No	13(54.2)	14(60.9)		
Monthly Income			0.03	0.871
< 3million Won	11(45.8)	2(43.5)		
3million Won ≤	13(54.2)	9(56.5)		
Number of Family Members	3.1 \pm 1.3	3.7 \pm 1.1	−1.64	0.107
Smoking Habit			0.52	0.471
Yes	14(58.3)	11(47.8)		
No	10(41.7)	12(52.2)		
Exercise			0.74	0.69
None	7(29.2)	7(30.4)		
Once per week	12(50.0)	9(39.2)		
2 times per week	5(20.8)	7(30.4)		
Depression			2	0.157
Yes	2(8.3)	0(0.0)		
No	22(91.7)	23(100.0)		

Exp = Experimental group, Con = Control group; Won = Korean currency.

3.2. Homogeneity Test Between the Two Groups in Outcome Variables

There were no significant differences between the two groups in decisional balance, DRSE and drinking behavior at the baseline (Table 3).

Table 3. Homogeneity test of outcome variables.

Item	Exp.(n = 24) Mean ± SD	Con.(n = 23) Mean ± SD	t	p
Decisional Balance				
Pros	25.2 ± 6.8	25.6 ± 4.4	−0.26	0.793
Cons	31.2 ± 6.4	27.6 ± 9.5	1.49	0.142
Drinking Refusal Self-Efficacy	50.1 ± 14.1	49.6 ± 12.5	0.12	0.904
Negative affect	10.9 ± 4.9	11.0 ± 3.9	−0.07	0.948
Positive and social	10.4 ± 3.9	9.7 ± 4.4	0.53	0.6
Physical and other concerns	15.4 ± 3.9	15.8 ± 2.7	−0.45	0.652
Withdrawal and urges	13.4 ± 3.9	13.0 ± 3.9	0.33	0.746
Alcohol Drinking Behavior	8.8 ± 1.3	8.6 ± 1.1	0.64	0.524
Drinking frequency	7.8 ± 4.1	6.4 ± 3.5	1.29	0.202
Drinking amount	9.5 ± 4.1	8.9 ± 2.7	0.54	0.595

Exp. = Experimental group, Con. = Control group.

3.3. Effects of the MI with CBT Intervention on Outcome Variables

There were no significant changes in the costs of drinking ($F = 2.190$, $p = 0.118$) and drinking behavior ($F = 2.120$, $p = 0.135$) in the intervention group compared to the control group. However, the benefits of drinking ($F = 3.827$, $p = 0.025$) and DRSE ($F = 4.426$, $p = 0.015$) in the intervention group significantly changed compared to the control group (Table 4).

3.4. Qualitative Themes

We identified four themes: reduction of benefits of drinking, changes in thoughts about costs of drinking, changes in drinking behavior, and achieving self-efficacy.

3.4.1. Theme 1. Reduction of Benefits of Drinking

Sub-Theme: Self-Understanding of the Impact of Drinking on Health

Recalling drinking behaviors during counseling, participants came to understand that body fatigue and liver disease are related to “almost every day” habitual drinking. One participant noted:

“I had a drink the other day. It was okay in the morning and when it was evening, it was dark and I thought again. I drank it without hesitance. It (MI with CBT) seems to be a turning point in the pattern of drinking. I drank almost every day. It becomes habit and daily routine. I got fat, my body was fatigued, and a fatty liver came.” (Participant 11)

Sub-Theme: Realizing the Benefits of Change in Drinking Behavior

Participants chose to drink less, describing positive experiences such as improved health and joy during daily life with their families. The value and desire that they discovered added to their motivation to change by solving the ambivalence:

“I did not have that experience when someone was concerned about my habits or life, and because of that concern, I was going to flow to the good side. Time to deal with my family . . . I was tired before, but in the morning, I picked my daughter up to school. As my eye sight were getting better, I think that I had a strong desire to reduce alcohol.” (Participant 13)

3.4.2. Theme 2. Changes in Thoughts about Costs of Drinking

Sub-Theme: Changes in Thoughts about Excessive Drinking Standards

Participants compared the objective information received through MI with CBT intervention with the negative consequences from drinking that they had experienced,

eventually accepting that their previous thinking about drinking had been wrong and changing their thinking about standards for excessive drinking:

“Before that, I drank a lot of alcohol. I did not care at that time. It was more like drinking. At that time, I did not feel like drinking much. When I talked to the practitioner, I thought I would drink only one bottle or two bottles at a time of usual drinking. I never would have thought that drinking three bottles was a lot before. But now I think it’s a lot.” (Participant 8)

Table 4. Comparison of experimental and control before and after the intervention.

Item	Experimental Group (n = 24)			Control Group (n = 23)			Time Effect F (p-Value)	Time * Group Effect F (p-Value)
	Baseline	4 Weeks	8 Weeks	Baseline	4 Weeks	8 Weeks		
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD		
Decisional Balance								
Pros	25.2 ± 6.8	21.5 ± 5.8	21.1 ± 7.4	25.6 ± 4.4	26.5 ± 3.7	25.5 ± 5.2	2.85 (0.063)	3.83 (0.025)
Lowest score	8.0	8.0	8.0	13.0	19.0	10.0		
Highest score	34.0	32.0	32.0	30.0	35.0	35.0		
Cons	31.2 ± 6.4	29.2 ± 9.7	31.5 ± 8.3	27.6 ± 9.5	30.6 ± 6.7	29.0 ± 8.7	0.25 (0.778)	2.19 (0.118)
Lowest score	18.0	9.0	8.0	8.0	9.0	8.0		
Highest score	40.0	40.0	40.0	40.0	38.0	38.0		
DRSE	50.1 ± 14.1	53.8 ± 16.0	61.5 ± 14.9	49.6 ± 12.5	49.5 ± 12.5	49.3 ± 16.9	3.95 (0.023)	4.43 (0.015)
Lowest score	23.0	28.0	34.0	29.0	31.0	3.0		
Highest score	73.0	80.0	80.0	73.0	76.0	71.0		
Negative affect	10.9 ± 4.9	14.7 ± 4.4	15.6 ± 4.3	11.0 ± 3.9	11.7 ± 3.8	11.6 ± 4.4	10.38 (<0.001)	5.89 (0.004)
Positive and social	10.4 ± 3.9	11.4 ± 4.8	12.8 ± 5.0	9.7 ± 4.4	10.1 ± 3.7	10.3 ± 4.1	2.244 (0.112)	0.83 (0.439)
Physical and other concerns	15.4 ± 3.9	16.9 ± 3.6	17.2 ± 3.5	15.8 ± 2.7	14.6 ± 3.4	14.4 ± 4.9	0.12 (0.845)	5.10 (0.013)
Withdrawal and urges	13.4 ± 3.9	15.5 ± 4.7	16.3 ± 3.9	13.0 ± 3.9	13.0 ± 3.8	13.0 ± 4.8	3.07 (0.051)	3.22 (0.045)
ADB	8.8 ± 1.3	5.0 ± 2.7	4.5 ± 2.9	8.6 ± 1.1	5.9 ± 2.8	5.5 ± 2.9	71.45 (<0.001)	2.12 (0.135)
Lowest score	6.0	0.0	0.0	6.0	1.0	0.0		
Highest score	11.0	110.0	10.0	10.0	10.0	6.0		

DRSE = Drinking refusal self efficacy, ADB = Alcohol drinking behavior.

3.4.3. Theme 3. Changes in Drinking Behavior

Sub-Theme: Commitment to Change in Drinking Behavior

Participants continued to consider the importance and feasibility of determining their changes in drinking behavior and became increasingly positive about their efforts to practice making these changes:

“When I drink alcohol, I can cut down a drink or two. I can control myself. Surely, I drank a lot of alcohol. Drinking less is a big issue for drinkers. It is very important to drink less. Ten points. That’s as important as that, but I cannot help but keep it 50%. It’s about 6–7 points.” (Participant 9)

3.4.4. Theme 4. Achieving Self-Efficacy

Sub-Theme: Repetitive Experience of Success Leads to Confidence

Participants tried to change their drinking behavior after searching for alternatives. Successful outcomes for repeated attempts to change drinking behavior have led clients to begin building an important sense of confidence in their abilities, as one participant recalled:

“I know that change requires a little experience. I do not know what I learned intellectually. At first, I was not confident... I thought I had something I couldn’t do. I had to try and get it. When I did one, I was able to do it again. I told myself to do it.” (Participant 4)

Sub-Theme: Feeling of Accomplishment by Changing Self-Control Ability

Participants were able to remain in control even when they were drinking with their friends. The feeling of accomplishment that followed resulted in an increased feeling of self-esteem that made them feel great:

“I can drink less. (Friends) look different. I feel so good because my friends tell me that. I feel like this is great. I’m doing it right. I feel so strange. When we meet a friend, we get disarmed. Now, I can control it. It is not easy for drinkers to control drinking.” (Participant 3)

4. Discussion

To prevent problems with AUD from sustainable perspectives, it is important to practice motivational intervention and to induce changes in drinking behavior as early as possible. Using the embedded design integrating qualitative approach into a quantitative experiment, this study identified that MI with CBT improves DRSE (Cohen’s $d = 0.5$), especially in the categories of negative affect (Cohen’s $d = 0.2$), withdrawal and urges (Cohen’s $d = 0.1$), physical and other concerns (Cohen’s $d = 0.1$), and reduced benefits of drinking (Cohen’s $d = 0.3$).

First, in the MI with CBT intervention group, the DRSE score increased over time compared to the control group ($F = 4.426, p = 0.015$). These results were consistent with those from the previous study that suggested that self-efficacy is a key factor in determining behavioral changes [23,26,39–41]. The specific behavioral skills to control drinking behavior made it possible for the clients to improve their self-regulation ability to control the urge of drinking in high-risk situations. During the interviews, the participants wrote self-monitoring diaries for drinking behaviors, which led them to think about reasons why they were drinking and how to control their drinking behavior. Participants also showed that they could control drinking behaviors based on their growing confidence as they accumulated experience with changing drinking behaviors, and that they were able to cope with negative emotions and concerns while accepting the help and emotional support of the practitioner. These results demonstrated the effects of MI through empathic communication and CBT through continuous monitoring of the drinking behavior of the clients to improve self-efficacy [10,11,20]. Improved self-efficacy enables clients to decide to make a change and also to attempt drinking behavior changes [39]. Since higher self-efficacy is maintained over a shorter goal achievement period, we measured and checked the effects after providing the counseling interventions every week. When self-efficacy increases, efforts to acquire and achieve self-regulation skills also develop [26]. Therefore, participants are expected to show a positive outcome for maintaining changes in drinking behavior. However, pathway analysis is needed to reveal a clear cause-and-effect relationship between self-efficacy and drinking behavior change. In the future, it is necessary to investigate the causal relationship between increased self-efficacy through MI with CBT and drinking behavior changes.

Second, participants in the MI with CBT intervention group had a lower score of benefits of drinking than the control group ($F = 3.827, p = 0.025$). Participants stated that they spent more time with their families and improved their physical condition due to changes in drinking behavior. Similarly, increased communication with the practitioner helped participants socialize without drinking and communicate more often with family members. In other words, it was perceived that the positive effects experienced by drinking behavior were similarly satisfied through the compassion process of the practitioner. This is due to the more objective evaluation of self as a process of cognitive changes such as consciousness-raising, self-re-evaluation, or environmental re-evaluation [42]. These results support the previous study that found a decrease in the pros scores due to participants’ recognition of the drinking problem and their enhanced intrinsic motivation, both of which are related to a positive treatment outcome [10,43,44]. Problem drinkers’ consideration of the benefits of control drinking is an important predictor of their behavioral change [25]. Their completion of decisional balance exercises and exploration of their own previously

unconsidered values or inner needs may have effectively reduced their perceived pros of drinking [25]. However, there was no statistically significant difference in the score of the costs of drinking between the two groups ($F = 2.190, p = 0.118$), which suggests that the score of pre-intervention was already high and therefore did not show change after intervention. These results showed that it was difficult to change the costs of drinking behavior within eight weeks. Nevertheless, it is suggested that the change in standards for excessive drinking may have affected the motivation for change. Participants in the qualitative interview already knew the negative effects of alcohol, and they were more likely to accept the positive effects of behavioral change while experiencing the negative effects of drinking behavior. Rationalization about drinking behavior is closely related to improving behavioral change [20,45]. Future interventions should consider not only communication that reveals clients' perception of drinking behavior, inner desires, and values, but also changes in core beliefs that determine changes in drinking behavior.

Third, most of the previous studies reported changes in drinking behavior [46–49], although there was no significant difference in the reduction of drinking behavior between the two groups. It may be difficult to make a real change with such a short follow-up period. In particular, on the eighth week, two participants continued to experience the urge to drink and depressive mood even though the results of the analysis except for these were found to have statistical significance in the reduction of problem-drinking behavior. They also had a 4–5-point decrease in their DRSE score compared to before the program. The qualitative data also suggest that it is difficult to change drinking behavior within eight weeks, as it takes time for individuals to determine and practice changes in drinking behavior. While autonomy is achieved through MI with CBT intervention, and increased competence promotes intrinsic motivation [10,11], states of alcoholism as a learned reward behavior or severe depression make it difficult for clients to change their behaviors [3]. In future interventions, it will be necessary to provide a more tailored service that can induce behavioral changes, to assess the psychological symptoms of urges to drink and depressive symptoms in detail, and to consider whether it is necessary to refer clients to a specialist for addiction problems.

This study has some limitations. We recruited a small number of male participants from a single workplace, which may limit the generalizability of the findings. There are limitations to evaluating the effects of a study like this in a short period of time as well as limitations to a self-reported method. Since this study was aimed at preventing alcoholism, we did not consider a family history of AUD or diagnosis of depression because the participants were socially functional employees. In the future, it will be necessary to consider family history of alcoholism and depressive symptoms of participants. Further studies are also warranted to investigate the effectiveness of MI with CBT for more participants in diverse work settings. Furthermore, we propose follow-up studies that extend the intervention duration and apply objective measurements.

5. Conclusions

This study showed that MI with CBT produced positive changes in motivation and self-efficacy among heavy drinkers. Improved motivation and self-efficacy through MI with CBT are expected to change problem-drinking behavior. Through an embedded mixed method, it was confirmed that their inner needs, values, and core beliefs should be addressed to promote motivation for change. Furthermore, continuous self-monitoring and problem-solving skill exercises were useful strategies to increase self-efficacy. Because these interventions are simple and easy to apply, they will be suitable and useful for problem-drinking prevention strategies in the public health sector. Thus, from sustainable perspectives, further efforts to disseminate these strategies will be worthwhile.

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References

- Babor, T.F.; McRee, B.G.; Kassebaum, P.A.; Grimaldi, P.L.; Ahmed, K.; Bray, J. Screening, Brief Intervention, and Referral to Treatment (SBIRT) Toward a Public Health Approach to the Management of Substance Abuse. *Subst. Abus.* **2007**, *28*, 7–30. [[CrossRef](#)] [[PubMed](#)]
- Rehm, J.; Mathers, C.; Popova, S.; Thavorncharoensap, M.; Teerawattananon, Y.; Patra, J. Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *Lancet* **2009**, *373*, 2223–2233. [[CrossRef](#)]
- Enoch, M.A.; Goldman, D. Problem drinking and alcoholism: Diagnosis and treatment. *Am. Fam. Physician* **2002**, *65*, 441–448. [[PubMed](#)]
- World Health Organization. *Global Status Report on Alcohol and Health 2018*; World Health Organization: Geneva, Switzerland, 2019.
- National Health Medical Research Council. *Australian Guidelines to Reduce Health Risks from Drinking Alcohol*; National Health Medical Research Council: Canberra, Australia, 2020.
- Gerace, L.M.; Hughes, T.L.; Spunt, J. Improving nurses' responses toward substance-misusing patients: A clinical evaluation project. *Arch. Psychiatr. Nurs.* **1995**, *9*, 286–294. [[CrossRef](#)]
- Emmen, M.J.; Schippers, G.M.; Bleijenberg, G.; Wollersheim, H. *The Motivational Drinker's Check-Up: A Brief Intervention for Early Stage Problem Drinkers. Handbook of Motivational Counseling: Concepts, Approaches, and Assessment*; Cox, W.M., Klinger, E., Eds.; John Wiley & Sons, Ltd.: Chichester, UK, 2004.
- Substance Abuse Mental Health Services Administration(SAMHSA). *Results from the 2010 National Survey on Drug Use and Health: Summary of National Findings*; Substance Abuse Mental Health Services Administration(SAMHSA): Rockville, MD, USA, 2011.
- Miller, W.R. Motivational Interviewing with Problem Drinkers. *Behav. Cogn. Psychother.* **1983**, *11*, 147–172. [[CrossRef](#)]
- Miller, W.R.; Rollnick, S.P. *Motivational Interviewing: Preparing People for Change*, 2nd ed.; The Guilford Press: New York, NY, USA, 2002.
- Miller, W.R.; Rollnick, S. *Motivational Interviewing: Helping People Change*, 3rd ed.; The Guilford Press: New York, NY, USA, 2013.
- Deci, E.L.; Ryan, R.M. Self-determination theory: A macrotheory of human motivation, development, and health. *Can. Psychol. /Psychol. Can.* **2008**, *49*, 182. [[CrossRef](#)]
- Ryan, R.M.; Patrick, H. Self-determination theory and physical activity: The dynamics of motivation in development and wellnwss. *Hell. J. Psychol.* **2009**, *6*, 107–124.
- Substance Abuse Mental Health Services Administration. *Enhancing Motivation for Changes in Substance Abuse Treatment*; Treatment Improvement Protocol Series 35; SAMHSA, US Department of Health and Human services: Rockville, MD, USA, 1999.
- Babor, T.F. Brief intervention strategies for harmful drinkers: New directions for medical education. *CMAJ: Can. Med. Assoc. J.* **1990**, *143*, 1070.
- Sim, M.G.; Wain, T.; Khong, E. Influencing behaviour change in general practice: Part 1-brief intervention and motivational interviewing. *Aust. Fam. Physician* **2009**, *38*, 885.
- Jo, S.J.; Lee, H.K.; Kang, K.; Joe, K.H.; Lee, S.B. Efficacy of a Web-Based Screening and Brief Intervention to Prevent Problematic Alcohol Use in Korea: Results of a Randomized Controlled Trial. *Alcohol. Clin. Exp. Res.* **2019**, *43*, 2196–2202. [[CrossRef](#)] [[PubMed](#)]
- Chew, H.S.J.; Cheng, H.Y.; Chair, S.Y. The suitability of motivational interviewing versus cognitive behavioural interventions on improving self-care in patients with heart failure: A literature review and discussion paper. *Appl. Nurs. Res.* **2019**, *45*, 17–22. [[CrossRef](#)] [[PubMed](#)]
- Moyers, T.B.; Houck, J. Combining motivational interviewing with cognitive-behavioral treatments for substance abuse: Lessons from the COMBINE research project. *Cogn. Behav. Pract.* **2011**, *18*, 38–45. [[CrossRef](#)]
- Narr, S.; Safren, S.A. *Motivational Interviewing and CBT: Combining Strategies for Maximum Effectiveness*; Guilford Press: New York, NY, USA, 2017.

21. Barrett, S.; Begg, S.; O'Halloran, P.; Howlett, O.; Lawrence, J.; Kingsley, M. The effect of behaviour change interventions on changes in physical activity and anthropometrics in ambulatory hospital settings: A systematic review and meta-analysis. *Int. J. Behav. Nutr. Phys. Act.* **2021**, *18*, 7. [[CrossRef](#)] [[PubMed](#)]
22. Chermack, S.T.; Bonar, E.E.; Goldstick, J.E.; Winters, J.; Blow, F.C.; Friday, S.; Ilgen, M.A.; Rauch, S.A.; Perron, B.E.; Ngo, Q.M.; et al. A randomized controlled trial for aggression and substance use involvement among Veterans: Impact of combining Motivational Interviewing, Cognitive Behavioral Treatment and telephone-based Continuing Care. *J. Subst. Abuse Treat.* **2019**, *98*, 78–88. [[CrossRef](#)]
23. DiClemente, C.C.; Doyle, S.R.; Donovan, D. Predicting treatment seekers' readiness to change their drinking behavior in the COMBINE Study. *Alcohol. Clin. Exp. Res.* **2009**, *33*, 879–892. [[CrossRef](#)]
24. Gullo, M.J.; Dawe, S.; Kambouropoulos, N.; Staiger, P.K.; Jackson, C.J. Alcohol Expectancies and Drinking Refusal Self-Efficacy Mediate the Association of Impulsivity With Alcohol Misuse. *Alcohol. Clin. Exp. Res.* **2010**, *34*, 1386–1399. [[CrossRef](#)]
25. Miller, W.R.; Rose, G.S. Motivational Interviewing and Decisional Balance: Contrasting Responses to Client Ambivalence. *Behav. Cogn. Psychother.* **2015**, *43*, 129–141. [[CrossRef](#)]
26. Bandura, A. A sociocognitive analysis of substance abuse: An agentic perspective. *Psychol. Sci.* **1999**, *10*, 214–217. [[CrossRef](#)]
27. Greer, J.A.; Jacobs, J.; Pensak, N.; MacDonald, J.J.; Fuh, C.X.; Perez, G.K.; Ward, A.; Tallen, C.; Muzikansky, A.; Traeger, L. Randomized Trial of a Tailored Cognitive-Behavioral Therapy Mobile Application for Anxiety in Patients with Incurable Cancer. *Oncologist* **2019**, *24*, 841–848. [[CrossRef](#)]
28. Reinert, D.F.; Allen, J.P. The alcohol use disorders identification test: An update of research findings. *Alcohol. Clin. Exp. Res.* **2007**, *31*, 185–199. [[CrossRef](#)]
29. Wade, D.; Varker, T.; Forbes, D.; O'Donnell, M. The Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) in the assessment of alcohol use disorders among acute injury patients. *Alcohol. Clin. Exp. Res.* **2014**, *38*, 294–299. [[CrossRef](#)] [[PubMed](#)]
30. Désy, P.M.; Howard, P.K.; Perhats, C.; Li, S. Alcohol screening, brief intervention, and referral to treatment conducted by emergency nurses: An impact evaluation. *J. Emerg. Nurs.* **2010**, *36*, 538–545. [[CrossRef](#)] [[PubMed](#)]
31. Babor, T.F.; Higgins-Biddle, J.C.; Saunders, J.B.; Monterio, M.G. *The Alcohol Use Disorders Identification Test: Guidelines for Use in Primary Care*; World Health Organization: Geneva, Switzerland, 2001.
32. Kim, J.S.; Oh, M.K.; Park, B.K.; Lee, M.K.; Kim, G.J.; Oh, J.K. Screening criteria of alcoholism by alcohol use disorders identification test(AUDIT) in Korea. *J. Korean Acad. Fam. Med.* **1999**, *20*, 1152–1159.
33. Rollnick, S.; Heather, N.; Bell, A. Negotiating behaviour change in medical settings: The development of brief motivational interviewing. *J. Ment. Health* **1992**, *1*, 25–37. [[CrossRef](#)]
34. Allen, J.P.; Litten, R.Z.; Fertig, J.B.; Babor, T. A review of research on the Alcohol Use Disorders Identification Test (AUDIT). *Alcohol. Clin. Exp. Res.* **1997**, *21*, 613–619. [[CrossRef](#)]
35. Maddock, J.E. *Development and Validation of Decisional Balance and Processes of Change Inventories for Heavy, Episodic Drinking*; University of Rhode Island: Kingston, RI, USA, 1997.
36. Diclemente, C.C.; Carbonari, J.P.; Montgomery, R.P.G.; Hughes, S.O. The alcohol abstinence self-efficacy scale. *J. Stud. Alcohol* **1994**, *55*, 141–148. [[CrossRef](#)] [[PubMed](#)]
37. Hsieh, H.F.; Shannon, S.E. Three approaches to qualitative content analysis. *Qual. Health Res.* **2005**, *15*, 1277–1288. [[CrossRef](#)]
38. Creswell, J.W.; Creswell, J.D. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 4th ed.; Sage Publications: Thousand Oaks, CA, USA, 2014.
39. Diclemente, C.C. Self-Efficacy and the Addictive Behaviors. *J. Soc. Clin. Psychol.* **1986**, *4*, 302–315. [[CrossRef](#)]
40. Bandura, A. Self-efficacy: Toward a unifying theory of behavioral change. *Psychol. Rev.* **1977**, *84*, 191–215. [[CrossRef](#)]
41. Bandura, A. *Self-Efficacy: The Exercise of Control*; Springer: New York, NY, USA, 1997.
42. Prochaska, J.O.; Norcross, J.C.; Diclemente, C.C. *Changing for Good*; HarperCollins: New York, NY, USA, 1994.
43. Blume, A.W.; Lostutter, T.W.; Schmaling, K.B.; Marlatt, G.A. Beliefs about drinking behavior predict drinking consequences. *J. Psychoact. Drugs* **2003**, *35*, 395–399. [[CrossRef](#)]
44. Hasking, P.; Lyvers, M.; Carlopio, C. The relationship between coping strategies, alcohol expectancies, drinking motives and drinking behaviour. *Addict. Behav.* **2011**, *36*, 479–487. [[CrossRef](#)] [[PubMed](#)]
45. Hasking, P.A.; Oei, T.P.S. Incorporating coping into an expectancy framework for explaining drinking behavior. *Curr. Drug Abuse. Rev.* **2008**, *1*, 20–35. [[CrossRef](#)] [[PubMed](#)]
46. Noknoy, S.; Rangsin, R.; Saengcharnchai, P.; McCambridge, J. RCT of effectiveness of motivational enhancement therapy delivered by nurses for hazardous drinkers in primary care units in Thailand. *Alcohol Alcohol.* **2010**, *45*, 263–270. [[CrossRef](#)] [[PubMed](#)]
47. Hester, R.K.; Delaney, H.D.; Campbell, W. The College Drinker's Check-Up: Outcomes of two randomized clinical trials of a computer-delivered intervention. *Psychol. Addict. Behav.* **2012**, *26*, 1. [[CrossRef](#)]
48. Kaner, E.; Bland, M.; Cassidy, P.; Coulton, S.; Dale, V.; Deluca, P.; Gilvarry, E.; Godfrey, C.; Heather, N.; Myles, J. Effectiveness of screening and brief alcohol intervention in primary care (SIPS trial): Pragmatic cluster randomised controlled trial. *BMJ Br. Med. J.* **2013**, *346*, e8501. [[CrossRef](#)]
49. Collaborative, A.E.S.R. The impact of screening, brief intervention and referral for treatment in emergency department patients' alcohol use: A 3-, 6-and 12-month follow-up. *Alcohol Alcohol. (Oxf. Oxf.)* **2010**, *45*, 514. [[CrossRef](#)]