Effect of Motivational Enhancement Therapy on Probability of Relapse among Clients with Substance Use Disorders

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Abstract:
***Background**: Substance use disorders (SUDs) often involve cycles of relapse. Prevention of relapse is the primary goal for effective treatment. Motivational Enhancement Therapy (MET) offers a client-centered approach to address these internal barriers to prevent treatment prematurely potentially before completing detoxification recovery. This study aimed to assess the effect of Motivational Enhancement Therapy on Probability of Relapse, among Clients with Substance Use Disorders. **Methods**: A quasi-experimental study was conducted on a convenient sample of 60 clients with SUDs at El-Maamoura Hospital for Psychiatric Medicine in Alexand6ria. **Tools:** The Sociodemographic and Clinical Data Structured Interview Schedule and The Advance Warning of Relapse Scale were used. **Results:** There was a statistically significant improvement in the total score of the probability of relapse Scale at post-intervention and maintained at 3 months of follow-up (55.52 SD=7.42, 68.67 SD=7.13, 68.74 SD=7.24, respectively), with a large effect size of 90.2%. **Conclusions:** Motivational Enhancement Therapy was found to be effective in reducing the probability of relapse among clients with SUDs. MET was found to improve treatment adherence,*

Introduction:

Substance Use Disorders (SUDs) are a chronic illness associated with compulsive drug-seeking and taking behaviors, leading to a common repeating cycle of abstinence and relapse (Hasin et al., 2013). Relapse is a critical period in the recovery process that can hinder treatment efforts and hinder the achievement of recovery goals (DiClemente & Crisafulli, 2022). It refers to a breakdown in the client's attempt to change substance use behaviors or continue using substances after a significant period of sobriety beyond the period of detoxification (Swanepoel et al., 2016). According to the National Institute on Drug Abuse (NIDA), 40–75% of clients relapse within 3 weeks to 6 months of completing treatment (Hasin et al., 2013).

Relapse is a gradual process, divided into three stages: emotional, mental, and physical. Clients in the emotional stage often experience negative emotions, leading to isolation, noncompliance with treatment therapy, and unhealthy eating and sleeping patterns. During a mental relapse, clients experience ambivalence from an internal struggle between maintaining sobriety and the desire to return to substance use. Finally, clients actively return to using drugs at the physical relapse stage (Guenzel & McChargue, 2024; Melemis, 2015).

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Moreover, recent studies have shown that contributing personal factors such as lack of motivation are the primary obstacle that increases the probability of relapse and will exacerbate emotional and mental relapse.(DiClemente & Crisafulli, 2022; Krijnen-de Bruin et al., 2022) Clients with SUDs who are unmotivated to follow up on the treatment often drop out and discontinue the treatment, causing an early relapse (Lappan et al., 2020). Conversely, studies have demonstrated that a strong desire for change positively predicts the outcome of substance disorder treatment (Votaw & Witkiewitz, 2021)

Consequently, many researchers all over the world are focusing their work on preventing further progression toward physical relapse by implementing effective interventions for early signs of emotional and mental relapse as well as installing hope to abstinence (DiClemente & Crisafulli, 2022; Ndou & Khosa, 2023). Motivational Enhancement Therapy (MET) is a therapeutic approach designed to enhance a client's intrinsic motivation to prevent relapse) (Manuel et al., 2012).. It aims to resolve ambivalence about change and strengthen commitment to recovery (LaChance et al., 2009). Research has shown that MET can have a positive impact on various outcomes related to SUD treatment, treatment engagement (Miller et al., 2003; Moore et al., 2018). However, the specific effect on the probability of relapse rate among clients with SUDs remains an area of interest and investigation. Moreover, very little research has been published on the effectiveness of MET during the detoxification process (Berman et al., 2010). In Egypt, there are scarce resources about the effect of MET on clients with SUDs.

Psychiatric Mental Health Nurses are part of the multidisciplinary team and have more contact with clients than other staff during the detoxification period (Imkome, 2018). They have a crucial role in motivating clients to engage in the treatment and decreasing the probability of relapse.

Aims of the study

This paper aims to determine the effect of motivational enhancement therapy on the probability of relapse among clients with substance use disorders.

Research Hypothesis

Clients with Substance Use Disorders who received Motivational Enhancement Therapy sessions exhibited a decrease in the probability of relapse than those who had hospital routines.

Materials and Method
Materials

Design: A quasi-experimental research design will be utilized in this study.

Settings: The study was conducted at the detoxification and rehabilitation wards for clients with SUDs at El-Maamoura Hospital for Psychiatric Medicine in Alexandria. The services provided at the detoxification ward include pharmacotherapy and meditation. The services provided at rehabilitation centers include meditation and 12-step NA group sessions.

Subjects: A convenience sample of 70 clients with SUDs (35 per group) who are newly admitted to the detoxification unit, have no comorbidity with other psychiatric disorders, can read and write, and are free from acute withdrawal symptoms. The sample size was calculated using G*Power Windows. 3.1.9.7 program by the following parameters: the number of groups to be studied = 2 (study group and control group), the number of measurements = 3 (pretest, posttest, follow-up), and the following parameters: effect size f = 0.25, α err. Prob. =0.05, Power (1-β err. Prob.) = 0.99.

Tools:
Tool I: **Sociodemographic and Clinical Data Structured Interview Schedule:**
The researcher constructed this tool to elicit clients' sociodemographic characteristics, including age, gender, and marital status. It

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also covered clinical characteristics such as type and duration of substance use, reason for substance use, and reason for seeking treatment.

Tool II: The Advance WArning of RElapse (AWARE) Questionnaire:

The AWARE Questionnaire was designed by Gorski and Miller (1982) to assess the probability of relapse for alcohol use or drug dependence. The scale was later refined from its original 37-item version to the current 28-item scale (version 3.0) (Miller & Harris, 2000). Each item is rated on a seven-point Likert scale. The response scores of 28 items range from 1 (never) to 7 (always), with 5 items being reversed. The total score range is 28–196. The higher the score, the more warning signs of relapse are being reported by the client. The expected percentage of relapse during the next two months is based on the following table:

AWARE Score	If not abstinent in the previous 2 months	If abstinent in the previous 2 months
28-55	37%	11%
56-69	62%	21%
70-83	72%	24%
84-97	82%	25%
98-111	86%	28%
112-125	77%	37%
126-168	90%	43%
169-196	>95%	53%

The reliability of the AWARE questionnaire was measured using Cronbach's alpha coefficient ($\alpha = 0.92$) and the test-retest reliability ($r = 0.80$). its validity was reported as 0.80 (Kelly et al., 2011).

Method

- The study received approval from the Ethical Research Committee at the Faculty of Nursing, Alexandria University. Subsequently, official permission was obtained from the General Secretariat of Mental Health and the director of EL-Maamoura Hospital for Psychiatric Medicine to conduct the study.
- The Tool II: AWARE was translated into Arabic by bilingual experts and evaluated for content validity by a jury of five psychiatric nursing experts.
- The researcher completed online training programs on Motivational Enhancement therapy by the University of Virginia and motivational interviewing for addiction by Dr William Miller & Dr Theresa Moyers.
- A pilot study was done on 10% of clients with SUDs to test tools and identify challenges. These clients were excluded from the actual study.
  The reliability of tool II was assessed using Cronbach's alpha method on 15 clients, resulting in an acceptable reliability coefficient of 0.830.

Data were collected as follows:

- Newly admitted detoxification unit clients who met the criteria were recruited as studied clients, who were individually met to establish rapport, explain the study purpose, and obtain consent.
- The baseline tests of tools I and II were conducted individually for the studied groups.
- Data was collected from the control group first, followed by the study group to prevent double contamination, which could affect the study results.

- **Control group:**
- Clients had received routine hospital care only (meditation and pharmacotherapy). The posttest of Tool II was assessed individually after two weeks in the detoxification unit.
- The clients transferred to the rehabilitation unit to receive routine hospital care (NA program, individual and group therapy). The follow-up test of Tool II was assessed individually 3 months before their discharge from the hospital.

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- **Study group:**
  - The first 5 clients admitted to the detoxification ward and matched with the control group received 6/ one-hour group sessions of MET /twice a week for 3 weeks.
  - MET sessions begin with a relaxation exercise, followed by brief introductions of clients and their reasons for group participation. Homework assignments are assigned at the end of each session.
  - MET sessions are initiated by an orientation session where clients are introduced to the group norms and their goals and discuss the cycle of change norms. In the second session, clients explore the impact of substance use on their lives and identify feelings related to their substance use. In the third session, clients examine the pros and cons of substance use and identify the discrepancy between their values and their behavior. In the fourth session, clients learn strategies for coping with cravings and high-risk situations and practice refusal skills and role-playing. In the fifth session, clients discuss relapse prevention strategies and the importance of rewarding successes, setting goals, and assigning homework related to behavioral self-monitoring. Finally, in the sixth session, clients review their progress and future goals and reassess their commitment, confidence level, and motivation to change.
  - After completion of the sessions, another 5 patients were selected and exposed to the same sessions. The selection of each five patients was repeated until the required number of study subjects was achieved.
  - After the termination of MET sessions for each study group, a posttest will be done for each client individually using tool II.
  - The clients transferred to the rehabilitation unit to receive treatment as usual (NA program, individual and group therapy). The follow-up test of Tool II was assessed individually 3 months before their discharge from the hospital.
  - Data was collected by the researchers during the period from November 2022 to July 2023.

Ethical considerations:
- Informed written consent was obtained from the recruited patients or their accompanying persons after explaining the aim of the study.
- Data confidentiality was assured and respected. The patient's privacy was considered and respected.
- The patient's voluntary participation and the right to withdraw were respected.

Statistical analysis of the data

Data were coded, computerized, and then analyzed using the Statistical Package for Social Science (SPSS) software package version 23.0 following data entry, checking, and verification processes were carried out to avoid any errors during data entry. Numbers and percentages were used for describing and summarizing qualitative data. ANONA with repeated measures followed by Adjustment Bonferroni for multiple comparisons between the three periods. t-independent rest was used. The significance of the obtained results was judged at the 5% level.

Results

Table I The study and control groups were ages 20-48 years old, with a mean age of 34.2 ± 6.72 years. The majority were craft workers or laborers (40% and 45.7%, respectively). Single clients made up 54.3% and 54.3% of the study and control groups, respectively. Urban residents constituted 85.7% and 80% of the study and control groups, respectively. No significant differences were found across all socio-demographic characteristics..

Table II The study found that most subjects used multiple substances, with 82.9% of the study group and 85.7% of the control group

using heroin and tramadol. The duration of substance abuse ranged from 10-15 years, with a mean duration of 10.6 ± 3.6 years. Health concerns were the most common reason for seeking treatment, followed by social pressure and personal motivation.

Figure I The study compared the probability of relapse between the study and control groups at pre-intervention, post-intervention, and follow-up. Both groups had high relapse probabilities. However, the study group's probability of relapse significantly decreased to 58.0, while the control group's decreased slightly to 153.40. At follow-up, the study group's probability of relapse continued to decrease to 43.45.

Figure II shows the change in the numbers of clients during SUD treatment in the study and control groups at the pre-intervention, post-intervention, and follow-up. It shows that the study group had 35 participants at pre-intervention, post-intervention, and follow-up. In contrast, the numbers of control groups decreased from 35 at pre-intervention to 27 at post-intervention, then further to 23 at follow-up, with a total dropout of 12 clients.

Table III The study compared the probability of relapse between the control and study groups at pre-intervention, post-intervention, and 3 months post-intervention. The study group had a 95% probability of relapse before intervention, while the control group had a 95% probability of relapse at pre-intervention. After implementing MET, 57.1% of participants reported a 62% probability of relapse. At follow-up, 80% of participants reported a 11% probability of relapse. The pairwise comparison showed a statistically significant difference in relapse probability. In the control group, 68.6% reported a 95% probability of relapse at pre-intervention, followed by a 90% probability at post-intervention and a 21% probability at 3 months. No significant difference was found at pre-intervention, but a significant

difference was observed after intervention and follow-up.

Table IV The study compared the probability of relapse between the study and control groups. The study group showed large effect sizes on the probability of relapse at the differences from pre-intervention to post-intervention and pre-intervention to follow-up. The larger effects were observed for the probability of relapse ($\eta^2 = 0.957$) and for the probability of relapse ($\eta^2 = 0.991$). The control group showed no effect sizes on the probability of relapse at the pre-intervention to post-intervention contrasts.

Discussion
Relapse is a significant barrier to recovery for clients with substance use disorders (SUDs), hindering treatment efforts and gains made to date. The lack of motivation during the critical detoxification period highlights the urgent need for brief, effective interventions that can strengthen clients' commitment to recovery and reduce the probability of relapse. The present study was conducted to determine the effect of Motivational Enhancement Therapy on the probability of relapse among clients with substance use disorders.

The main findings of the current study showed that implementing MET during detoxification resulted in improved treatment engagement, and transition to rehabilitation, highlighting the potential of MET to reduce dropout rates during the crucial detoxification stage. The MET group had zero dropouts, compared to eight in the control group. This finding suggests that MET could enhance treatment retention (Dutra et al., 2008), which may be related to its focus on increasing clients' internal motivation and readiness for change (Miller & Rollnick, 2023).

This finding is in line with several studies, as (Schwenker et al., 2023), (Secades-Villa et al., 2004), and (Berman et al., 2010), studied the effect of MET on

treatment retention for clients with SUDs. they reported significantly lower dropout rates among clients receiving MET compared to standard care during the initial month of treatment. These findings underscore the potential of MET to help clients overcome ambivalence, thereby reducing the likelihood of premature termination during the demanding detoxification phase. Additionally, MET was found to be beneficial for pregnant substance users in decreasing substance use, particularly in minority participants.

In contrast, a study by (Shaul et al., 2020) that found no significant difference in treatment retention rates between clients receiving MET and those receiving standard care. This would suggest that MET may not always be effective in reducing dropout rates during the initial phase of treatment for clients with SUDs.

The current result showed MET demonstrated a significant immediate impact on relapse probability during the detoxification period. This difference highlights the potential benefits of integrating MET early in the treatment process (Hartzler et al., 2018). MET's focus on collaboratively developing coping skills and strengthening change-related commitment (Miller & Rollnick, 2013) may underpin these short-term gains in preventing relapse.

This was consistent with (Moore et al., 2018) that MET can be used as a preliminary step in detoxification to motivate clients in treatment engagement. Another study suggested that MET may be used as a prelude to further treatment to improve treatment engagement (Kells et al., 2019; Moore et al., 2018). This was consistent with intrinsic motivation theory where an individual motivated to complete a task tends to improve him/herself to achieve it (Mohapatra & Panda, 2023).

The study revealed the effectiveness of MET in reducing the probability of relapse at the three-month follow-up strengthening the case for MET's enduring effects. These findings support prior research suggesting MET's potential for lasting effects beyond initial treatment (e.g., Carroll et al., 2006). MET-developed skills and enhanced motivation likely contribute to a decrease the probability of relapse.

The results agreed with Limburger& Andretta,(2018) reported that motivation to change behavior is the same results when MET was added to the hospital routine. there was a significant, positive decrease in the probability of relapse scores. The increase was greater than any changes among clients who receive only hospital programs. This can be explained by the person-centered concept of MET group therapy. MET emphasizes collaboration that helps participants assess their level of readiness for change(Miller et al., 2003). Participants in our study could focus on finding meaning in their lives, and on setting life goals. They could realize the benefits of pursuing life goals, as a result, they were able to replace hopelessness with hope, construct a concrete path to reach their goals, improve their commitment to abstain, and finally decrease the probability of replace.

Conclusion

the study not only corroborates the hypothesis that MET can decrease the probability of relapse in clients undergoing treatment for SUDs but also suggests that the therapy improves treatment adherence, and reduces dropout rates.

Recommendations

o Implementing MET in the detoxification unit to ensure that clients are motivated and committed to their treatment.
o Psychiatric nurses should also be educated on MET strategies so that they can incorporate it into detoxification care.

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- o Explore the effectiveness of MET in diverse populations, settings, and across different types of SUDs to enhance the generalizability of the findings.

Limitations of study

The study's main limitation is its limited generalization potential due to the small sample size.

Table (I): Distribution of the study and control groups with substance use disorders according to their Socio-demographic.

Socio-demographic characteristics	Study group (N=35)		Control group (N=35)		Test of significance	
	No	%	No	%	χ^2	P
Age of the patient (years)						
Min-Max	20-48		21-47			
Mean ± SD	34.2 ± 6.72		32.8 ± 6.15		t=0.909	0.367
Occupation						
▪ Unemployed	8	22.9	7	20		
▪ Driver	12	34.3	10	28.6	0.842	MC P= 0.893
▪ Craft worker/ laborer	14	40	16	45.7		
▪ Commercial worker	1	2.9	2	5.7		
Marital status						
▪ Single	19	54.3	16	45.7		
▪ Married	11	31.4	14	40	0.617	0.734
▪ Divorced/ Widowed	5	14.3	5	14.3		
place of residency						
▪ Urban	30	85.7	28	80		
▪ Rural	5	14.3	7	20	0.402	0.526

X2: Chi-square test   t: Independent Samples Test
MC: Monte Carlo
No significant difference if P > 0.05.

Table (II): Distribution of the study and control groups with substance use disorders according to their clinical characteristics.

| Clinical characteristics	Study group (N=35)		Control group (N=35)		Test of significance	
	No	%	No	%	χ^2	P
Type of substances used**						
▪ Heroin	29	82.9	30	85.7	0.108	0.500
▪ Tramadol	27	77.1	25	71.4	0.299	0.584
▪ Gabapentin	12	34.3	9	25.7	0.612	0.603
▪ Cannabis	28	80	27	77.1	0.085	0.771
▪ Benzodiazepines	5	14.3	3	3.6	0.565	0.710[Mc]
▪ Synthetic drugs (Astrox, Shabu, and Crystal)	10	28.6	12	34.3	0.265	0.797
Duration of substance use/years					U	P
▪ **Min-Max**	4 – 16		2 - 18			
▪ **Mean ± SD**	10.6 ± 3.6		10.56 ± 4		=610.5	0.984
Reasons for treatment-seeking**						
▪ Social pressure	13	37.1	14	40	0.60	0.806
▪ Personal motivation	12	34.3	15	42.9	0.543	0.461
▪ Health problems	14	40.0	13	37.1	0.60	0.806
▪ Legal issues	6	17.1	8	22.9	0.357	0.550
▪ Employment problems	9	25.7	11	31.4	0.280	0.597
▪ Financial problems	10	28.6	12	34.3	0.265	0.607

T: Independent Samples Test
U: Mann Whitney test
X2: Pearson Chi-square test
*no significant difference if P > 0.05
**This was a multiple response question where clients may endorse more than one choice

Figure 1: Estimated changes in the mean value of the probability of relapse between the study and control groups at pre-intervention, post-intervention, and follow-up.
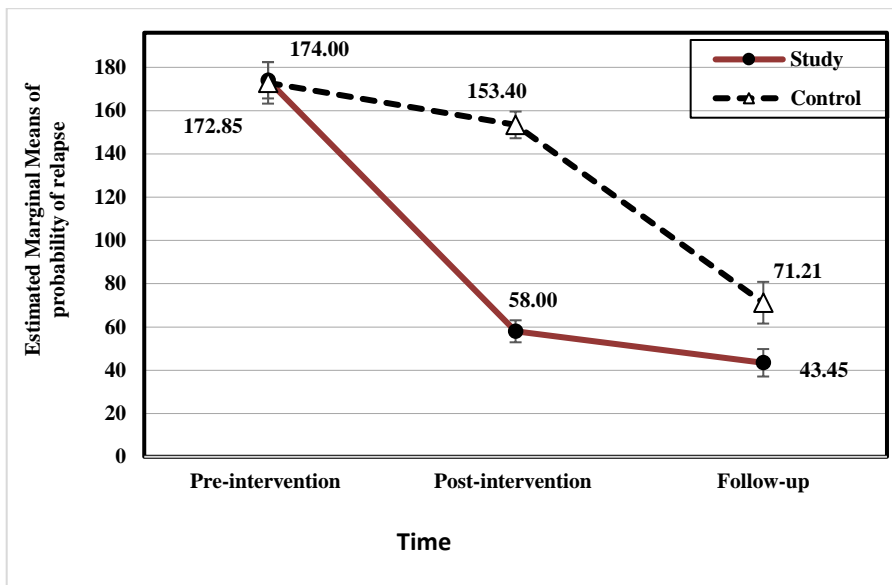
Figure II: Numbers of clients during suds treatment in study and control groups at the pre-intervention, post-intervention, and follow-up.
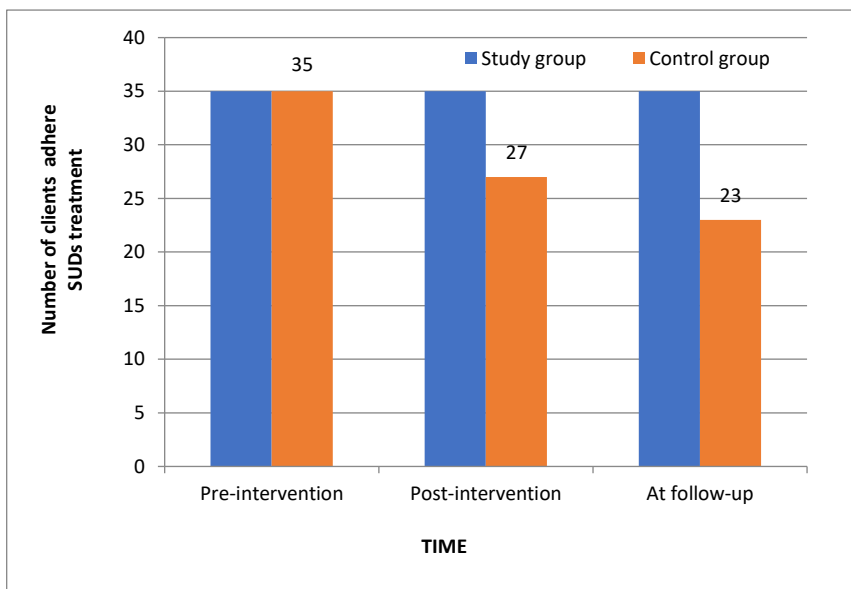
Table (III): Comparison of the mean value of probability of relapse between the study and control groups, at pre-intervention, post-intervention and follow up after implementation of MET.

Probability of relapse	Study group						Control group						Comparing between groups		
	Pre-intervention (n = 35)		Post-intervention (n = 35)		Follow-up (n = 35)		Pre-intervention (n = 35)		Post-intervention (n = 27)		Follow-up (n = 23)		Pre	Post	Follow up
Expected percentage of relapse after 2 months	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	χ^2(p)		
11%	0	0.0%	0	0.0%	28	80.0%	0	0.0%	0	0.0%	4	17.4 %			
21%	0	0.0%	0	0.0%	6	17.1%	0	0.0%	0	0.0%	6	26.1 %			
24%	0	0.0%	0	0.0%	1	2.9%	0	0.0%	0	0.0%	10	43.5 %			
25%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3	13.0%	0.650 (0.592)	62.00* (<0.001)	27.038* (0.001)
37%	0	0.0%	13	37.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%			
62%	0	0.0%	20	57.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%			
72%	0	0.0%	2	5.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%			
90%	8	22.9%	0	0.0%	0	0.0%	11	31.4%	27	100.%	0	0.0%			
95%	27	77.1%	0	0.0%	0	0.0%	24	68.6%	0	0.0%	0	0.0%			
Total score													t (p₀)		
Min. – Max.	154.0 -190.0		49.0 - 72.0		33.0 - 70.0		148.0 -191.0		141.0 -163.0		55.0 - 87.0		0.747 (0.458)	73.618a (0.001)	27.383* (0.001*)
Mean ± SD	174.0±8.37		58.0±5.09		43.45±5.35		172.85 ± 9.62		153.40 ± 6.11		71.21 ± 9.64				
F(P₀)	2907.94*(<0.001*)						1466.948*(<0.001*)								
	P₁<0.001* p₂ <0.001* p₃ <0.001*						P₁<0.001* p₂ <0.001* p₃ <0.001*								

t, p: t and p values for Student t-test for comparing between the two groups
χ^2, p: χ^2 and p values for Chi square test for comparing between the two groups
F, P₀: F and p value for ANOVA with repeated measures for comparing between the three periods within each group
p₁: p-value for Adjustment for multiple comparisons: Bonferroni pre and Immediate p₂: p-value for Adjustment for multiple comparisons: Bonferroni pre and post-one-month p₃: p-value for Adjustment for multiple comparisons: Bonferroni Immediate and post-one-month * Statistically significant p-value at ≤0.05.

Table IV: The effect sizes (eta squared values) on the probability of relapse between study and control groups at the pre-intervention to post-intervention and pre-intervention to follow-up.

Probability of Relapse	Pre-intervention /post intervention Effect Size η^2		Pre-intervention /Follow-up Effect Size η^2	
	Study group MET +TAU₁	Control group TAU₂	Study group MET +TAU₁	Control group TAU₂
	0.957	0.071	0.991	0.974

η^2= Partial Eta Squire
No effect > 0.2
Small effect 0.2 0.5
Intermediate effect 0.5 0.8
Large effect more than 0.8

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