Addictive Behaviors 38 (2013) 2321–2324

Contents lists available at SciVerse ScienceDirect

Addictive Behaviors

Short Communication

Motivational Interviewing in an ordinary clinical setting: A controlled clinical trial at the Swedish National Tobacco Quitline

Helena Lindqvist [a,*], Lars G. Forsberg [a], Lisa Forsberg [a], Ingvar Rosendahl [a], Pia Enebrink [a], Asgeir R. Helgason [b,c,d]

[a] Department of Clinical Neuroscience, Karolinska Institutet, SE-171 76 Stockholm, Sweden
[b] Department of Public Health Sciences, Karolinska Institutet, SE-171 76 Stockholm, Sweden
[c] Reykjavik University, Iceland
[d] Centre for Epidemiology and Community Medicine, Stockholm County Council, Sweden

HIGHLIGHTS

- MI significantly improved client 6-month continuous abstinence rate compared to ST.
- The MI implementation was partly successful in this ordinary clinical setting.
- MI counsellors had significantly higher MITI scores compared to ST counsellors.

ARTICLE INFO

Keywords:
Smoking cessation
Motivational interviewing
Controlled clinical trial
Clinical practice
Treatment integrity
Telephone counselling

ABSTRACT

Introduction: The present study aimed to assess the effect of adding Motivational Interviewing (MI) to the first session of an effective smoking cessation treatment protocol in an ordinary clinical setting: the Swedish National Tobacco Quitline (SNTQ).
Method: The study was designed as a controlled clinical trial. Between September 2005 and October 2006, 772 clients accepted the invitation to participate in the study and were semi-randomised to either standard treatment (ST) or MI. The primary outcome measures were self-reported 7-day point prevalence abstinence and 6-month continuous abstinence.
Results: At 12-month follow-up, the 772 clients were included in an intention to treat analysis. Of the clients allocated to MI, 57/296 (19%) reported 6-month continuous abstinence compared to 66/476 (14%) of the clients allocated to ST (OR 1.48, 95% CI 1.00–2.19; $P = .047$).
Conclusions: Integrating MI into a cognitive behavioural therapy-based smoking cessation counselling in an ordinary clinical setting at a tobacco quitline increased client 6-month continuous abstinence rates by 5%.

1. Introduction

One way to assist smokers seeking to quit is to establish telephone-based smoking cessation services ("quitlines"). Quitlines have proven both effective (Stead, Perera, & Lancaster, 2007; Zhu et al., 1996, 2002) and cost-effective (Tomson, Helgason, & Gilljam, 2004). The Swedish National Tobacco Quitline (SNTQ) is a nationwide free of charge service that is operated by the Stockholm County Council Health Service and funded by the Swedish Government.

This study assesses the effect of adding Motivational Interviewing (MI) to the existing SNTQ treatment protocol. It was hypothesised that the MI component would increase 7-day point prevalence abstinence and 6-month continuous abstinence at 12-month follow-up.

MI is a collaborative, client-centred, counselling approach designed to help clients change particular lifestyle behaviours, such as tobacco smoking (Miller & Rollnick, 2002). Research into the efficacy of MI in smoking cessation counselling has reported significant effects with modest effect sizes (Heckman, Egleston, & Hofmann, 2010; Hettema & Hendricks, 2010; Lai, Cahill, Qin, & Tang, 2010). However, in most smoking cessation studies, MI has been combined with another intervention. Studies have not been designed to gauge the effect of the added MI component alone (Heckman et al., 2010). Thus there is a lack of knowledge in respect of the effectiveness of the MI component in smoking cessation counselling.

* Corresponding author at: Karolinska Institutet, Department of Clinical Neuroscience, Liljeholmstorget 7B, Plan 6, SE-117 63 Stockholm, Sweden. Tel.: +46 8 123 391 12; fax: +46 8 641 93 88.
E-mail address: helena.lindqvist@ki.se (H. Lindqvist).

0306-4603
http://dx.doi.org/10.1016/j.addbeh.2013.03.002

2. Material and methods

2.1. Study design and setting

Ethical approval was granted by the Karolinska Institutet Northern Research Ethics Committee (00-367). The study was designed as a controlled clinical trial (trial registration number: NCT01121887) and subjects were recruited among individuals who called the SNTQ.

All SNTQ counsellors had received 6 months training in tobacco cessation counselling. The training was a combination of coaching skills and Cognitive Behavioural Therapy (CBT) techniques. A year before the commencement of the study, most SNTQ counsellors had participated in introductory MI workshops on two occasions.

2.2. Allocation of counsellors

Seventeen counsellors participated and were randomly assigned (by coin flip) to either standard treatment (ST) or MI. The allocation of the counsellors resulted in an uneven distribution of total working hours between the groups. In order to achieve a more equal distribution between the two arms, the groups were readjusted (again by coin flip). In total, nine counsellors were allocated to ST and eight counsellors to MI. During the study period, two of the MI counsellors left SNTQ. Consequently, the MI arm eventually came to consist of six counsellors.

2.3. Training of ST counsellors

The counsellors allocated to ST underwent training (including lectures on CBT) and supervision. Training and supervision totalled approximately 40 h over the study period. In addition, ST counsellors were offered group supervision on five occasions, and had access to CBT-based individual supervision upon request.

2.4. Training of MI counsellors

Counsellors allocated to MI underwent comprehensive MI training. Initial MI training consisted in a 2-day workshop made up of a mixture of didactics and practical exercises. Details of the MI training and supervision have been published elsewhere (Forsberg, Forsberg, Lindqvist, & Helgason, 2010).

2.5. Allocation of clients

Given the clinical setting, it was not practicable to implement formal randomisation of clients. As an alternative, the allocation of clients to treatment arms was determined by the client's first contact with an SNTQ counsellor. The client's first call was allocated to the first available counsellor. Whether this counsellor was ST trained or MI trained determined which treatment arm the client would belong to for the duration of the study.

2.6. Recruitment of clients and data collection procedures

A total of 4208 people called SNTQ to discuss their own smoking behaviour during the recruitment period (September 2005 to October 2006). Callers who only wanted to ask short practical questions, had apparent mental impairments or had major difficulties understanding Swedish were not invited to participate. Some counsellors forgot or did not have time to invite clients and some clients were invited but declined. In total, 1380 out of 4208 (33%) clients orally consented to participating in the study and were sent a postal baseline registration questionnaire. The purpose of the baseline questionnaire was to confirm client identity and to seek written informed consent to follow-up. Clients who returned the questionnaire constituted the study base. Of the 1380 clients, 69 clients had their first session with counsellors who were hired after the study commenced and were therefore excluded. Of the remaining 1311 clients, 818/1311 (62%) of client first sessions were with an ST counsellor and 493/1311 (38%) of client first sessions were with an MI counsellor. Of the clients whose first session was with an ST counsellor, 476/818 (58%) returned the baseline questionnaire, whilst 296/493 (60%) of clients whose first session was with an MI counsellor returned the questionnaire. In total, 772 clients returned the questionnaire. We found no statistically significant differences regarding baseline characteristics between the two arms.

If a client called the quitline more than once, subsequent calls were transferred to a counsellor who belonged to the same treatment arm as the counsellor who had taken their first call, as far as this was possible. Of the ST clients, 83 (17%) had at least one subsequent session with an MI counsellor upon additional calls, whereas 47 (16%) MI clients had at least one of subsequent calls with an ST counsellor.

Twelve months after the initial contact with SNTQ, clients received a postal follow-up questionnaire. In order to minimise drop out, clients who did not return their baseline or follow-up questionnaire received one reminder letter by post and one via a phone call.

2.7. Treatment integrity assessment

Throughout the study period all SNTQ counsellors were instructed to audio-record treatment sessions at six-week intervals ('assessment periods'). Counsellors were instructed to audio-record the first three treatment sessions for every 'assessment period'. At the end of the study, five randomly selected sessions from each counsellor (one ST counsellor only had two recorded sessions, and one MI counsellor only had three) from the middle of the study period were coded using the Swedish translation of the Motivational Interviewing Treatment Integrity Code (MITI) version 3.0 (Moyers, Martin, Manuel, Miller, & Ernst, 2007). The MITI is a valid and reliable instrument for evaluating the use of MI (Forsberg, Berman, Kallmen, Hermansson, & Helgason, 2008; Forsberg, Kallmen, Hermansson, Berman, & Helgason, 2007; Moyers, Martin, Manuel, Hendrickson, & Miller, 2005). The inter-rater reliability between the two coders who coded the sample was calculated as intra-class correlations (ICC) using a two-way mixed model with absolute agreement. The ICC ranged from 'good' to 'excellent' (single measure reliability range 0.69–0.98) (Cicchetti, 1994).

2.8. Outcome measures

Self-reported "point prevalence abstinence" was assessed using a follow-up questionnaire. The question posed was "Have you had one puff of smoke or more within the past 7 days?". Those who reported abstinence were also asked to answer the additional question, "How long have you been abstinent?". "Continuous abstinence" was defined as: "not a single puff of smoke within the past 6 months or more".

2.9. Statistical analyses

Logistic regression analyses were used to compare arms. We controlled for potential confounders and did not find any variable that substantially (more than 10%) changed the strength of the association. Therefore, only unadjusted analyses are presented.

A two-level hierarchical analysis, with counsellors on the second level of the model, and each telephone call on the first level, was used in order to examine the between- and within-counsellor effect on outcome.

All statistical tests were two-sided, and p-values of 0.05 or less were considered to be statistically significant. Statistical analyses were performed using SPSS 19.0 and STATA IC Version 12.0.

Table 1
Client characteristics and medication by treatment condition at 12-month follow-up.

	ST[a] clients			MI[b] clients			*P*-value
	N = 288	%	Mean (SD)	N = 195	%	Mean (SD)	*P* < 0.05
Age			49 (14.8)			48 (14.2)	*P* = .429
Gender (female)	230/288	80		163/195	84		*P* = .302
Number of contacts			3 (2.4)			3 (2.8)	*P* = .490
Total contact time (min)			51 (43.7)			49 (47.5)	*P* = .612
Treatment protocol (proactive treatment)[c]	178/288	62		122/195	63		*P* = .866
Using smoking cessation medication[d]							
Proportion using NRT	176/274	64		109/183	60		*P* = .303
Proportion using other Medication	44/274	16		30/183	16		*P* = .924
Proportion using both NRT and other Medication	18/274	7		10/183	6		*P* = .629

[a] Standard treatment.
[b] Motivational interviewing.
[c] Clients are offered a choice between "reactive treatment" (clients initiate all contact) and "proactive treatment" (counsellors call back at appointed dates).
[d] 14 missing of the ST clients and 12 missing of the MI clients.

3. Results

3.1. Study retention, treatment dose and attrition analyses

195/296 (66%) of the MI clients and 288/476 (61%) of the ST clients returned the follow-up questionnaire ($P = .134$). See Table 1 for characteristics of the sample at 12-months follow-up.

An attrition analysis found three statistically significant characteristics. First, the mean age of clients who returned the follow-up questionnaire was 49 years (14.5), compared to the mean age of 45 (14.9) for non-responders ($P = .001$). Second, the mean number of years that clients had been smoking was higher in clients who returned the questionnaire (30 years; 13.8), compared to clients who did not (27 years; 13.8; $P = .011$). Third, the mean number of cigarettes smoked per day at baseline was 15 (7.6) in clients who returned the questionnaire compared to 17 (9.2) in clients who were lost to follow-up ($P = .019$).

3.2. Primary smoking cessation outcomes

In the intention to treat analysis, non-responders were assumed still to be smoking at follow-up. Among MI clients, 74/296 (25%) were point prevalence abstinent compared to 95/476 (20%) of ST clients (OR 1.34, 95% CI 0.95–1.89; $P = .100$). On the continuous abstinence measure the difference between treatments reached statistical significance; 57/296 (19%) MI clients were continuously abstinent, compared to 66/476 (14%) of ST clients (OR 1.48, 95% CI 1.00–2.19; $P = .047$).

In the subgroup analysis we included those clients who had completed the follow-up questionnaire and only talked either to MI counsellors or ST counsellors. Of the MI clients, 61/159 (38%) reported point prevalence abstinence, compared to 78/239 (33%) of the ST clients (OR 1.29, 95% CI 0.85–1.95; $P = .241$). Among MI clients, 44/158 (28%; 1 missing) reported continuous abstinence, compared to 56/239 (23%) of ST clients (OR 1.26, 95% CI 0.80–2.00; $P = .321$).

A two-level hierarchical logistic regression model showed very low between-cluster variance relative to within-cluster variance. The estimates and corresponding confidence intervals were almost identical to the one-level analysis. Therefore, we found no support for a counsellor effect related to factors extraneous to treatment.

3.3. Treatment delivery

MI counsellors delivered a significantly higher level of MI compared to the ST counsellors in all MI skill variables assessed by MITI 3.0 (see Table 2).

4. Discussion

The study found that the already effective ST treatment protocol at the SNTQ (Helgason et al., 2004) was improved by adding MI to the existing protocol. When clients were asked about their smoking in the last 6 months, the difference in outcome between clients who received MI (19%) compared to ST (14%) was statistically significant. Thus, MI appears to increase the effectiveness of smoking cessation counselling when integrated into standard treatment delivered in ordinary clinical conditions with unselected clients. However, the results of this study must be interpreted with caution, since no significant difference between the two treatment protocols was found in the subgroup analysis.

One of the main advantages of the study is the assessment of treatment fidelity. This study is one of few studies to measure the effect of MI in smoking cessation treatment where treatment fidelity has been assessed (Lai et al., 2010).

All SNTQ counsellors had received an introduction to MI prior to the study. This would be expected to dilute differences between the treatments. However, there were highly statistically significant differences between MI and ST counsellors in all MITI variables, which suggest that the two treatments were clearly different.

The generalizability of the results may be limited to smokers who self-initiate smoking cessation support, and return a baseline questionnaire. The relatively high dropout rate among clients at follow-up may further influence generalizability. However, the intention to treat analysis, which treated all clients lost to follow up as smokers, allow us some confidence that the effectiveness of the MI protocol was not overestimated.

Table 2
SNTQ counsellor MI skill assessed with MITI 3.0.

	ST[a] (N = 42)	MI[b] (N = 38)		
Global variables			Z	*P*-value
Empathy			−7.031	*P* < .001
Median	2	4		
25% percentile	2	3		
75% percentile	2.25	4		
MI spirit			−6.996	*P* < .001
Median	2	3.67		
25% percentile	1.33	3		
75% percentile	2.33	4		
Behaviour indices			t	*P*-value
Ratio reflections to questions			−6.418	*P* < .001
Mean (SD)	0.49 (0.35)	2.08 (1.49)		
% Complex reflections			−6.889	*P* < .001
Mean (SD)	0.18 (0.20)	0.41 (0.09)		
% MI adherent utterances			−10.635	*P* < .001
Mean (SD)	0.22 (0.19)	0.77 (0.26)		
% Open questions			−2.706	*P* = .009
Mean (SD)	0.24 (0.14)	0.34 (0.19)		

[a] Standard treatment.
[b] Motivational interviewing.

5. Conclusions

Integrating MI into CBT-based smoking cessation counselling in an ordinary clinical setting at a tobacco quitline increased client 6-month continuous abstinence rates by 5%.

Role of funding sources

The research was funded by the Swedish Cancer Society, Stockholm County Council, the Swedish Heart and Lung Association, the Swedish Research Council, the Swedish Council for Working Life and Social Research and the Swedish National Institute of Public Health. None of the funding sponsors had any role in the study design, collection, analysis or interpretation of data, the writing of the manuscript, or the decision to submit the paper for publication.

Contributors

Helena Lindqvist analysed and interpreted the data and drafted the manuscript. Lisa Forsberg assisted in the interpretation of data and helped draft the manuscript. Ingvar Rosendahl conducted statistical analyses of the data and made helpful comments on the manuscript. Pia Enebrink helped to interpret the data and made helpful comments on the manuscript. Lars G. Forsberg and Asgeir R. Helgason conceived and designed the study and supervised the data analysis and the drafting of the manuscript. All authors read and approved the final manuscript.

Conflict of interest

The authors declare that they have no conflicts of interest.

Acknowledgements

The authors would like to thank the counsellors working at the Swedish National Tobacco Quitline. In addition, the considerable assistance of Isra Black is gratefully acknowledged.

References

Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*, *6*, 284–290.

Forsberg, L., Berman, A. H., Kallmen, H., Hermansson, U., & Helgason, A. R. (2008). A test of the validity of the motivational interviewing treatment integrity code. *Cognitive Behaviour Therapy*, *37*, 183–191.

Forsberg, L., Forsberg, L. G., Lindqvist, H., & Helgason, A. R. (2010). Clinician acquisition and retention of motivational interviewing skills: A two-and-a-half-year exploratory study. *Substance Abuse Treatment, Prevention, and Policy*, *5*, 8.

Forsberg, L., Kallmen, H., Hermansson, U., Berman, A. H., & Helgason, A. R. (2007). Coding counsellor behaviour in motivational interviewing sessions: inter-rater reliability for the Swedish Motivational Interviewing Treatment Integrity Code (MITI). *Cognitive Behaviour Therapy*, *36*, 162–169.

Heckman, C. J., Egleston, B. L., & Hofmann, M. T. (2010). Efficacy of motivational interviewing for smoking cessation: A systematic review and meta-analysis. *Tobacco Control*, *19*, 410–416.

Helgason, A. R., Tomson, T., Lund, K. E., Galanti, R., Ahnve, S., & Gilljam, H. (2004). Factors related to abstinence in a telephone helpline for smoking cessation. *European Journal of Public Health*, *14*, 306–310.

Hettema, J. E., & Hendricks, P. S. (2010). Motivational interviewing for smoking cessation: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, *78*, 868–884.

Lai, D. T., Cahill, K., Qin, Y., & Tang, J. L. (2010). Motivational interviewing for smoking cessation. *Cochrane Database of Systematic Reviews*, *CD006936*.

Miller, W. R., & Rollnick, S. (2002). *Motivational interviewing: Preparing people for change* (2nd ed.). New York: Guilford Press.

Moyers, T. B., Martin, T., Manuel, J. K., Hendrickson, S. M., & Miller, W. R. (2005). Assessing competence in the use of motivational interviewing. *Journal of Substance Abuse Treatment*, *28*, 19–26.

Moyers, T. B., Martin, T., Manuel, J. K., Miller, W. R., & Ernst, D. (2007). Revised global scales: Motivational interviewing treatment integrity 3.0 (MITI 3.0). University of New Mexico, Center on Alcoholism, Substance Abuse and Addictions (CASAA) (Retrieved from http://casaa.unm.edu/download/miti3.pdf [last accessed 16 July 2012])

Stead, L. F., Perera, R., & Lancaster, T. (2007). A systematic review of interventions for smokers who contact quitlines. *Tobacco Control*, *16*(Suppl. 1), i3–8.

Tomson, T., Helgason, A. R., & Gilljam, H. (2004). Quitline in smoking cessation: A cost-effectiveness analysis. *International Journal of Technology Assessment in Health Care*, *20*, 469–474.

Zhu, S. H., Anderson, C. M., Tedeschi, G. J., Rosbrook, B., Johnson, C. E., & Byrd, M. (2002). Evidence of real-world effectiveness of a telephone quitline for smokers. *The New England Journal of Medicine*, *347*, 1087–1093.

Zhu, S. H., Stretch, V., Balabanis, M., Rosbrook, B., Sadler, G., & Pierce, J. P. (1996). Telephone counseling for smoking cessation: Effects of single-session and multiple-session interventions. *Journal of Consulting and Clinical Psychology*, *64*, 202–211.