

A moderated mediation approach to assess the impact of craving on smoking abstinence in cardiac patients

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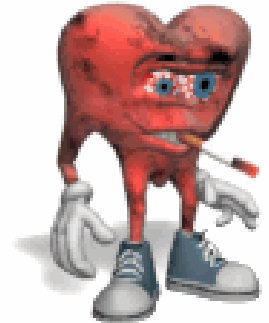


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Backgrounds (1)



- smoking is a main risk factor for cardiac diseases
- smoking cessation improves prognosis and prevents future cardiovascular incidents
- hospitalization increases the motivation to quit
- about 57% of cardiac patients persist in smoking or relapse after discharge
- smoking cessation interventions so far have only shown moderate effects in cardiac patients



Backgrounds (2)

- craving: “the urge to smoke which is the most commonly reported subjective response to cigarette withdrawal” (West & Schneider, 1987)
- sudden nicotine abstinence at hospital admission might cause cigarette cravings
- craving related to continued smoking after hospital discharge
- other factors:
 - high nicotine dependence;
 - anxiety;
 - type D personality;
 - low self-efficacy ...
 - and their relation with craving.



Study aims

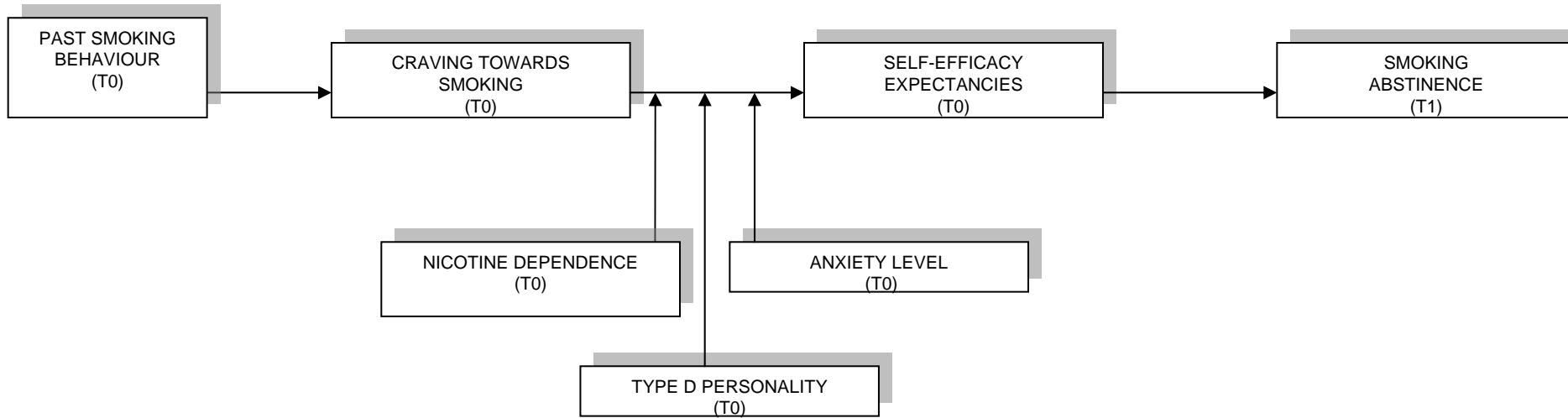
Insight into:

- the effect of self-efficacy expectancies on the relation of craving on smoking abstinence
- moderating effects of nicotine dependence, anxiety and type D personality



Study hypotheses

Figure 1. The conceptual model:



NOTE: T0 = measured at hospital admission, T1 = measured 6 months after hospital discharge; smoking = 0, prolonged smoking abstinence = 1; no-type D personality = 0, type D personality = 1

Mediation

H1: Self-efficacy expectancies are primary mediators in the relation between craving and smoking abstinence.

Moderated mediation

H2: The mediation effect of self-efficacy

- (a) applies for patients with low/high nicotine dependence levels
- (b) applies for patients with low/high anxiety levels and
- (c) differs for patients with/without a type-D personality.



Methods: procedures and design (1)

- 8 comparable cardiology wards of hospitals throughout the Netherlands
- all eligible cardiac patients were invited to take part in a questionnaire survey
- longitudinal study, 3 successive measurements
 - T0 = hospital admission; T1 = 6 months follow-up; T2 = 12 months follow-up
- 244 patients included at T0; 185 completed the telephone interview at T1



Methods: Questionnaire and measures (2)

Determinants	Scales (No. Items, Cronbach's α)
Demographics	Items on demographic and disease-specific characteristics (6 items)
Nicotine dependence	Items on addiction level (Fagerström test) (6 items, .61)
Anxiety level	HADS anxiety subscale to detect states of anxiety (7 items, .80)
Type-D personality	Type-D Scale (DS14) to detect personality constructs of negative affect (7 items, .87) and social inhibition (7 items, .87)
Self-efficacy expectancies	Self-efficacy being able to refrain from smoking in emotional, habitual and social situations (10 items, .94)
Craving for cigarettes	Items on the urge to smoke the past 24 hours at hospital admission (desiring, missing, thinking of, and longing for a cigarette (6 items, .90)
Point-Prevalence Abstinence (PPA)	Self-reported smoking behaviour over the previous seven days assessed at T0 and T1
Prolonged Abstinence (PA)	Self-reported smoking behaviour over the previous 6 months, allowing a predefined grace period of two weeks assessed at T1



Results (1): Baseline characteristics

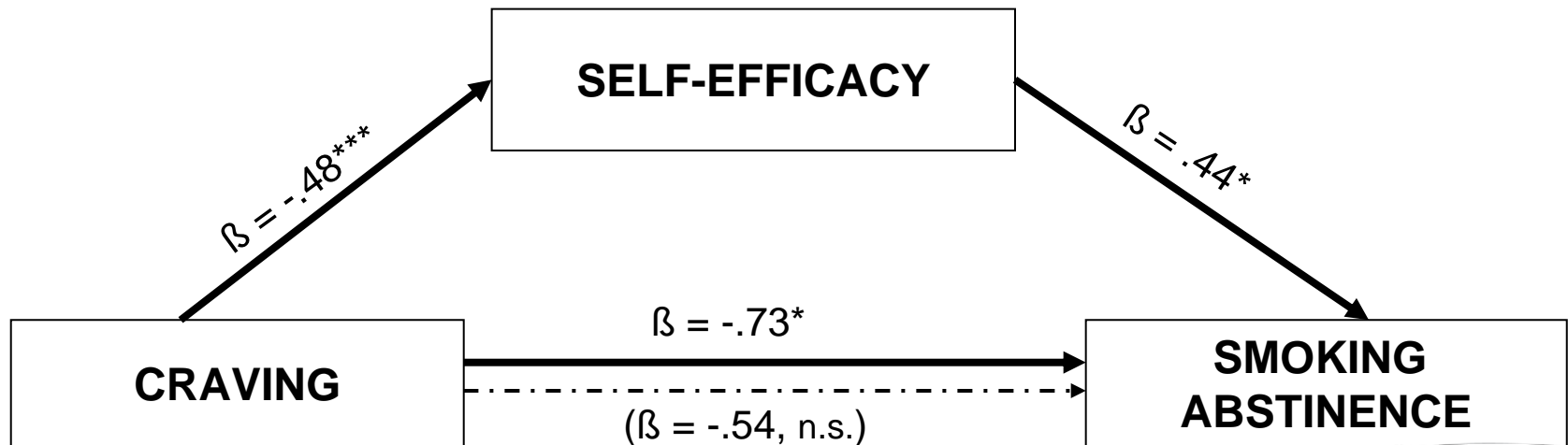
- 56 years of age (SD = 11.13)
- 52% married with children
- addiction level 4.8 (SD = 2.12)
- 18% previously admitted to hospital due to cardiac disease
- 67% not engaged in any quit attempt over previous 12 months
- 18% type D personality
- 33% not smoking over the past 7-days at admission
- 78% male
- 38% low education
- 42% high craving

NOTE: n = 185



Results (2): Simple mediation analysis

Figure 2. Simple mediation analysis with self-efficacy as the mediator (n=172)



NOTE: *** $p < 0.001$; ** $p < 0.01^*$; $p < 0.05$

Solid lines between variables denote direct paths between two variables; dotted lines denote path when self-efficacy is included as mediator. The betas after the mediation are in parentheses.

Bootstrap results for indirect effects:

95% lower CI	95% upper CI
-.525	-.025

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H1: Self-efficacy expectancies are primary mediators and decrease the direct effect of craving on smoking abstinence → **Confirmed.**

Results (3): Moderated mediation analyses

(1) Estimate and probe interaction effects

Nicotine dependence (ND):

- Interaction: craving x nicotine dependence → $p = .067$ (n.s.)

(2) Test conditional effects of the moderator for different values of the moderator

Conditional indirect effects of ND	Effect	SE	95% lower CI	95% upper CI
2.6040 (-1 SD)	-.072	.134	-.378	.174
4.7679 (Mean)	-.198	.123	-.507	-.021
6.9317 (+ 1 SD)	-.324	.184	-.771	-.050

Note : ND scores range from 0 - 10

H2 (a): The mediation effect of self-efficacy applies for patients with moderate and high nicotine dependence levels → **Partially confirmed.**

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Results (4): Moderated mediation analyses

(1) Estimate and probe interaction effects

Anxiety:

- Interaction: craving x anxiety $\rightarrow p = .025^*$

(2) Test conditional effects of the moderator for different values of the moderator

Conditional indirect effects of anxiety	Effect	SE	95% lower CI	95% upper CI
2.1641 (-1 SD)	-.321	.183	-.745	-.033
5.9842 (Mean)	-.191	.120	-.487	-.017
9.8043 (+ 1 SD)	-.061	.100	-.308	.094

Note : Anxiety scores range from 0 - 21

H2 (b): The mediation effect of self-efficacy applies for patients with low and moderate anxiety levels \rightarrow **Confirmed.**



Results (5): Moderated mediation analyses

(1) Estimate and probe interaction effects

Type D personality:

- Interaction: craving x type D personality $\rightarrow p = .64$ (n.s.)

(2) Test conditional effects of the moderator for different values of the moderator

Conditional indirect effects of type D	Effect	SE	95% lower CI	95% upper CI
Type D = 0	-.210	.138	-.542	-.016
Type D = 1	-.135	.161	-.512	.148

Note : 0 = no type D, 1 = type D

H2 (c): The mediation effect of self-efficacy differs for patients with or without a type D personality \rightarrow **Not confirmed.**



Discussion (1): main outcomes

Our study revealed that the following hypotheses were confirmed:

Mediation

Self-efficacy expectancies decrease the direct effect of craving on smoking abstinence at 6 months follow-up among cardiac patients.

Moderated mediation

The mediation effect of self-efficacy expectancies applies for patients with:

- moderate and low anxiety levels
- moderate and high nicotine dependence, however inconclusive.

No effect of type D as a moderator.



Discussion (2): limitations

- limited generalizability
- lack of biochemical verification of cessation
- loss of patients to follow-up (24%)
- preliminary results





Discussion (3): implications

- Smoking cessation programs for cardiac patients should:
 - identify patients with low/moderate anxiety levels and moderate/high ND
 - reduce craving levels among these patients by offering cognitive and/or nicotine replacement therapy at hospital admission
 - enhance self-efficacy expectancies in the process of smoking cessation.
- Importance of studying both moderators and mediators in the association between craving and smoking in cardiac patients.
- Future research should intervene on craving to examine whether this indeed leads to lower self-efficacy levels in hospitalized smokers.



“It's easy to quit smoking. I've done it hundreds of times.”

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