



Validity of urges to smoke measures in predicting smoking relapse: exploratory analysis of an RCT

Prof. Dr. Daniel Kotz
WAT symposium
Online, 23rd June 2021

Heinrich-Heine-University Düsseldorf
Institute of General Practice, Centre for Health and Society
Addiction Research and Clinical Epidemiology Unit
Maastricht University | University College London | University of Edinburgh

 www.daniel-kotz.de

 [@daniel_kotz](https://twitter.com/daniel_kotz)

Conflicts of interest

NO direct or indirect funding/payment from, or relationships with, the pharma, tobacco or e-cigarette industry or their lobby organisations.

Current research completely funded by public research organisations:

Ministerium für
Kultur und Wissenschaft
des Landes Nordrhein-Westfalen



European
Commission

Horizon 2020
European Union funding
for Research & Innovation



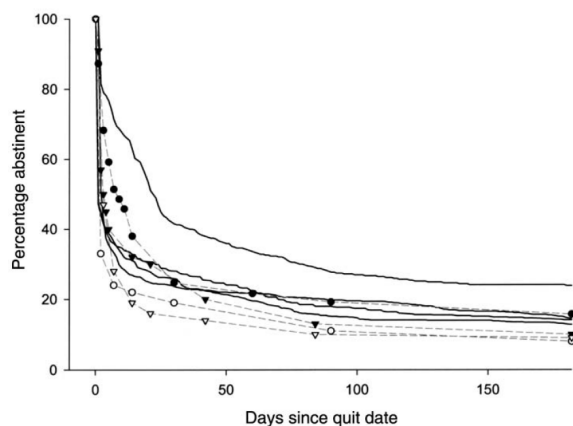
Bundesministerium
für Gesundheit

Investigator-initiated trial received partial funding from Pfizer in 2009

Smoking and relapse

- Tobacco smoking is a major risk factor for disease
- Continued smoking → risk of chronic morbidity, life-years lost (3 months for each year smoking) [Doll, BMJ 2004]
- Vital: attempt to stop as soon as possible, with highest chance of success
- However...

Smoking and relapse



**Relapse prevention =
top priority in smoking
cessation treatment**

[Hughes, Addiction 2004]

Identifying patients at high risk of relapse

- Many smokers receive smoking cessation treatment in primary care
- Relevant:
 - to **identify** patients at high risk of relapse
 - to **target** relapse prevention **interventions** efficiently

Measurement of urges to smoke

- Time spent with urges to smoke in the past 24 hours (**TSU**)
- Strength of urges to smoke (**SUT**)
 - taken from Mood and Physical Symptoms Scale [West, Psychopharmacology 2004]
 - valid to predict relapse in **current** smokers,
performed better than HSI (CPD, TTFC)
[Fidler, Addiction 2011]

Measurement of urges to smoke



TSU “Wie häufig haben Sie in den vergangenen 24 Stunden das Verlangen verspürt zu rauchen”

1. Überhaupt nicht
2. Selten
3. Manchmal
4. Häufig
5. Fast immer
6. Immer

Measurement of urges to smoke



SUT “Wie stark war dieses Verlangen im Allgemeinen?”

1. (Kein Verlangen TSU = 1)
2. Leicht
3. Mittelstark
4. Stark
5. Sehr stark
6. Extrem stark

Measurement of urges to smoke

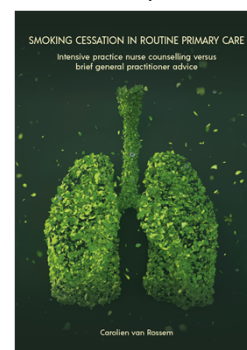
- Advantage of TSU/SUT vs. HSI (FTCD)
 - **do not rely** on measurements of cigarette consumption
 - can therefore also be used **in ex-smokers**
 - particular **in smokers currently trying to quit** smoking

Aims of the current study

- Explore usefulness of TSU/SUT in the context of primary care treatment
 - assess **validity in predicting long-term relapse** in patients who were abstinent from smoking for several weeks
 - apply **cut-point** on the rating of these urges to allow identifying patients at high risk of relapse more easily (binary: high vs. low risk)
 - using data from a **randomised controlled smoking cessation trial**
[van Rossem, Addiction 2017]

RCT design

- RCT compared effectiveness of intensive practice nurse counselling versus brief general practitioner (GP) advice, both combined with varenicline, for smoking cessation in primary care patients
- 10 primary healthcare centres in the Netherlands (SGE)
- October 2011 to July 2014
- Dutch Trial Register NTR3067
- Study protocol [van Rossem, Contemporary Clinical Trials 2015]
- Main findings published [van Rossem, Addiction 2017]



RCT design

- Primary outcome: prolonged smoking abstinence week 9-26 after treatment initiation, biochemically confirmed by exhaled carbon monoxide ($CO < 10\text{ppm}$), as defined by the Russell Standard [West, Addiction 2005]
- Secondary outcome: abstinence **week 9-52**
- TSU/SUT measured in week 9 after treatment initiation
- For comparison: HSI (CPD, TTFC) measured at baseline

Data analysis

- Logistic regression models (simple and adjusted for potential confounders)
 - TSU [week 9](#) > relapse during week 9-26 and week 9-52
 - SUT [week 9](#) > relapse during week 9-26 and week 9-52
 - same for CPD, TTFC, HSI [at baseline](#)

Data analysis

- TSU/SUT dichotomised with cut-points
 - sensitivity (SN)
 - specificity (SP)
 - positive predictive values (PPV)

Study population

- 295 smoking patients were included in the trial [van Rossem, Addiction 2017]
- **180** (61%) abstinent at week 9 = **current study population**
 - relapse week 9-26 = 42% (75/180)
 - relapse week 9-52 = 56% (100/180)
 - = prior probability / prevalence of relapse in this trial

Study population

- Mean age = 51 years (SD=12.0)
 - 52% (93/180) female
 - Mean score TSU = 1.63 (SD=0.67)
 - Mean score SUT = 1.81 (SD=0.90)
- ... indicating that majority of patients reported **slight** [“leicht”] urges to smoke **some of the time** [“selten”] during the past 24 hours

Table 1: Predictors of relapse during week 9-26 and week 9-52

Predictor	Relapse during week 9-26		Relapse during week 9-52	
	OR (95%CI)	aOR (95%CI)	OR (95%CI)	aOR (95%CI)
TSU in week 9	1.65* (1.03–2.63)	1.74* (1.05–2.89)	1.93* (1.17–3.18)	2.41** (1.33–4.37)
SUT in week 9	1.57* (1.11–2.21)	1.56* (1.07–2.28)	1.59* (1.11–2.28)	1.71* (1.14–2.56)
CDP at baseline	1.14 (0.78-1.66)	1.19 (0.77-1.83)	1.16 (0.79-1.69)	1.31 (0.85-2.03)
TTFC at baseline	0.92 (0.65-1.30)	0.76 (0.50-1.14)	0.80 (0.56-1.14)	0.73 (0.49-1.11)
HSI at baseline	1.01 (0.81-1.26)	0.96 (0.74-1.22)	0.96 (0.78-1.20)	0.98 (0.77-1.25)

TSU=time spent with urges (1–6=all of the time). SUT=strength of urges to smoke (1–6=extremely strong). CPD=cigarettes per day (<10, 11-20, 21-30, >31). TTFC=time to first cigarette (within 5 minutes, 6–30, 31–60, more than 60). HSI=Heaviness of Smoking Index (0–6=highest level of tobacco dependence). aOR=odds ratio adjusted for treatment group, healthcare centre, age, gender, education, income, level of self-efficacy, duration of longest previous quit attempt, level of depression, level of anxiety, number of smokers in the social environment, and alcohol misuse. * p<0.05, ** p<0.01

Table 2: Diagnostic parameters for urges to smoke measures as predictors of relapse during week 9-26 and week 9-52

Predictor	Week 9-26					Week 9-52				
	Relapsed (N)	Abstinent (N)	SN (%)	SP (%)	PPV ^a (%)	Relapsed (N)	Abstinent (N)	SN (%)	SP (%)	PPV ^b (%)
TSU <3	68	102	9.3	97.1	70.0	91	79	9.0	98.8	90.0
TSU ≥3	7	3				9	1			
SUT <4	69	104	8.0	99.0	85.7	94	79	6.0	98.8	85.7
SUT ≥4	6	1				6	1			

TSU=time spent with urges (1–6=all of the time). SUT=strength of urges to smoke (1–6=extremely strong). SN=sensitivity. SP=specificity. ^aPPV=positive predictive value given a 42% prevalence of relapse. ^bPPV=positive predictive value given a 56% prevalence of relapse.

Main findings

- Both TSU and SUT, measured after 9 weeks of abstinence in primary care patients receiving smoking cessation treatment, were **valid predictors of long-term relapse** after 26 and 52 weeks
- Applying a cut-point of ≥ 3 on TSU and ≥ 4 on SUT resulted in a **PPV of 90% and 86% after 52 weeks**, respectively

Limitations

- Analysis was **explorative** and not planned a priori
- Unclear whether urges were a direct measure of relapse risk or perhaps **only an indicator** for different, underlying reasons?
[Ferguson, Addiction 2011]
- Only measurement in week 9, whereas
 - urges are generally high at the beginning of a quit attempt and decrease over time
 - urges-to-smoke trajectories can vary considerably between smokers
[Javitz, Addiction 2011; Doherty, Psychopharmacology 1995]

Outlook

- Our idea of using urges to smoke measures as a **diagnostic tool** for the management of smoking cessation treatment may be of relevance for primary care and possibly other healthcare settings
- However: needs to be tested in a **pre-specified trial** specifically designed to investigate the feasibility and effectiveness of using urges to smoke measures as a diagnostic tool in primary care and possibly other settings

Thank you!

Collaborators: Carolien van Rossem, Wolfgang Viechtbauer, Mark Spigt,
Onno C.P. van Schayck

Primary healthcare centres SGE



@daniel_kotz