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Comparing Outcomes of ‘Voluntary’ and ‘Quasi-Compulsory’ Treatment of Substance Dependence in Europe

Michael Schaub^a, Alex Stevens^b, Daniele Berto^c, Neil Hunt^b, Viktoria Kerschl^d, Tim McSweeney^c, Kerrie Oeuvray^f, Irene Puppo^g, Alberto Santa Maria^h, Barbara Trinklⁱ, Wolfgang Werdenichⁱ, Ambros Uchtenhagen^a

^a Research Institute for Public Health and Addiction, Zurich, Switzerland; ^b European Institute of Social Services, University of Kent, Canterbury, UK; ^c Servizio Tossicodipendenza, Padova, Italy; ^d SPI Forschung, Berlin, Germany; ^e Institute for Criminal Policy Research, King’s College London, London, UK; ^f University of Fribourg, Fribourg, Switzerland; ^g Servizio Tossicodipendenza, Firenze, Italy; ^h Servizio Tossicodipendenza, Bari, Italy; ⁱ Lehr- und Forschungspraxis der Universität Wien, Vienna, Austria

Short title: Quasi-compulsory treatment outcomes in Europe

Corresponding author:

Michael Schaub, PhD
Research Institute for Public Health and Addiction
Konradstrasse 32, 8031 Zurich, Switzerland
Phone: +41 44 448 11 65
Fax: +41 44 448 11 71
Email: michael.schaub@isgf.uzh.ch

ABSTRACT

Aim This study evaluates quasi-compulsory drug treatment (QCT) arrangements for substance dependent offenders receiving treatment instead of imprisonment in comparison to voluntary treatment within five European countries. **Methods** Participants were interviewed with the European Addiction Severity Index, the ASI-crime module, questions on perception of pressure and self-efficacy, and the Readiness-to-Change Questionnaire at treatment entry and after 6, 12, and 18 months. **Results** Reductions in substance use and crime as well as improvements in health and social integration were observed in QCT and voluntary treatment groups. After controlling for various factors, subjects in the QCT and the comparison group showed similar reductions in substance use and crime over time. Study retention was comparable in both groups. **Conclusion** QCT is as effective as voluntary treatment provided in the same services in reducing substance use and crime.

Introduction

This international study presents the findings of an evaluation of quasi-compulsory drug treatment (QCT) arrangements for substance dependent offenders compared to voluntary treatment in the United Kingdom, Italy, Austria, Germany, and Switzerland. We define QCT as substance abuse/dependence treatment that is motivated, ordered, or supervised by the criminal justice system but takes place in a non-prison context. The goal of the study is to produce evidence for policy and practice on quasi-compulsory treatment of substance dependent offenders in Europe as policy and practice are currently implemented in the absence of reliable evidence in many countries [1].

To date, much attention has been paid to the use of the criminal justice system to direct drug-related offenders into treatment in many countries worldwide [2-6]. In Europe, QCT is applied in a variety of ways. England uses sentences which enable courts to order an offender to enter treatment for a specified period as an alternative to some other sentence, usually imprisonment. In Austria, Germany and Switzerland, legal arrangements are in place that can broadly be described as ‘therapy instead of punishment’, with the possibility to suspend prosecution or sentence on the condition that the offender enters treatment. In Italy, prison sentences of no more than 4 years, or the last 4 years of a longer prison sentence, can be replaced by a period in judicially supervised drug treatment but require the informed consent of the offender. In contrast to the Dutch SOV system, in which offenders may be placed in treatment institutions without their consent. European arrangements for QCT differ from the drug courts established in many states of the USA, in that they are not limited to drug offenders and are often used for persistent offenders, who would be excluded from several of the American drug court systems.

Literature on QCT shows that substance abuse and crime are often linked; however, the explanation for and direction of this link are not clear [7-14]. In general, studies – predominately from English speaking countries – tend to agree that QCT can be effective in reducing substance use and crime, and that it can improve health and social integration. They suggest that QCT is at least as effective as voluntary treatment [15-19] and that legal compulsion can improve retention in treatment [20, 21]. Longer retention has repeatedly been associated with improved outcome [22-26]. In contrast, literature from other countries (e.g., Germany, the Netherlands) tend to be more pessimistic about the effectiveness of QCT [1]. It must be highlighted that a large proportion of the research based on the topic of mandated vs. voluntary treatment for substance users is non-empirical in nature [27], with the majority of empirical studies failing to use adequate comparison groups [28]. These facts indicate the

importance of developing more sophisticated empirical methods for evaluating QCT as, in addition, previous studies tend to use relatively short follow-up periods [29]. Several studies suggest that perceived coercion [16] and motivation [30-32] are important in predicting outcome and that perceived coercion cannot be directly inferred from referral source [31-36]; however, investigations focusing on these variables are comparatively rare. In addition, several studies refer to the additional difficulties of providing treatment for substance users in the context of the criminal justice system as this involves the potential for conflict, misunderstanding, and inadequate sharing of information [37-40]. QCT arrangements among different countries differ in the stage at which people are encouraged to begin treatment, the level of compulsion used, and the types of crimes that are of focus [41, 42]. These methodical and political differences among various countries might explain the almost non-existent international comparisons of QCT arrangements.

In summary, a review of previous research suggests that more multimethod, multicenter studies of QCT are needed in order to inform policy and practice [1]. There is a need for more studies worldwide before more solid conclusions can be drawn regarding the effectiveness of substance abuse treatment under legal coercion [28].

To address the lack of European cross-cultural QCT outcome data and to meet the mentioned methodological weaknesses above, we designed a European multicenter study to test the following hypotheses:

1. The QCT group and the comparison group (people who are not in QCT, but are going through treatment in centers where people in the QCT group are treated) will show reductions in crime and substance use as well as increases in health and socialization.
2. If other factors are statistically controlled, the QCT group will have outcomes (crime and substance use) that differ from those of the comparison group.
3. If other factors are statistically controlled, the QCT group will display better retention than the comparison group.

Methods

Services and participant selection

Services from the United Kingdom, Italy, Austria, Germany, and Switzerland were selected if they treated participants eligible for the experimental QCT and the comparison group. The QCT group was defined as participants receiving treatment on court order (in- or outpatient),

as an optional alternative to imprisonment or other punishment, in a regular treatment institution. The comparison group was defined as persons entering voluntarily treatment institutions.

Inpatient treatment included almost exclusively abstinence-oriented drug addiction treatment after detoxification. Drug addiction treatment programs ranged from occupational therapy with few possibilities for drug counseling to highly structured individual and group therapy programs. Outpatient treatment mainly included weekly to monthly drug counseling. Participants in outpatient treatment with opiate addiction were predominantly treated in substitution programs. In the voluntary group, treatment length was depending on treatment concepts (inpatients) or individual decisions (outpatients). Non-compliance in the QCT group was depending on the respective countries' regulations and therefore, QCT participants were at risk of being sentenced to prison in most countries. Participants in the QCT group were included to the study at entry to treatment (having or awaiting a court sentence for QCT) and provided informed consent to participate in the study and for the use of their medical and police records (intention to treat design). All participants were asked to provide informed consent at treatment entry, were assured that all information would be handled confidentially, and were informed that they had the right to withdraw at any time without any consequences to their treatment and/or court sentence (if applicable). The study protocol was approved by the national or local ethics committees. All participants were exponentially paid for each follow-up interview between 10 and 20 Euros at 6, 12, and 18 months (FU1-3) in order to promote retention in the study.

Measures

Participants were interviewed using an amended version of the European Addiction Severity Index (Europ-ASI; [43]) and the ASI-crime module (ASI-C; [44]), both structured interviews that contain questions relevant to the participants' problems with substance abuse and its possible related and other crimes. "Poly drug use" in the Europ-ASI refers to the primarily combined drug use of two or more psychoactive substances to achieve a particular effect. Moreover, participants were assessed with a questionnaire from Hiller et al. [32] on perception of pressure (pressure from legal authorities, family or friends, employer(s), themselves, and others), an adapted version of the Proactive Coping Scale [45] to measure the subjects' belief of being capable of attaining certain goals (self-efficacy), and the Readiness-to-Change Questionnaire to measure the readiness to quit substance use [46]. The participant interviews were completed face-to-face by external interviewers (independent from the

treatment institution) who were trained in the use of the Europ-ASI. Interview guidelines and questionnaires unavailable in the required language were back-translated by native speaking experts in the research field. Participants were anonymously coded by a complex coding system that contained re-identification information about their treating country and institution, number within the institution, and study group classification.

Data collection and clearance

Study data were collected in the respective countries (table 1) and sent to Zurich, Switzerland for integration into the centralized database. Before the data were analyzed, a two-step control and correction process was administered. In the first step, data were checked for dual entry of the same participant, errors in participant identification, changes from one treatment service to another, and missing participants. In the second step, all data were controlled for missing values and content errors. A special ‘query procedure’ was developed in order to systematically collect corrections and enter them into the database. In many cases, two to three attempts were made before all corrections were integrated.

Statistical analyses

Study outcome data were analyzed according to the ‘intention to treat principles’, applying the ‘last observation carried forward’ (LOCF) method. Through this method, for each individual, missing values are replaced by the last observed value for each variable in order to avoid individuals with more severe baseline characteristics dropping out of further study outcome analyses. The QCT and the comparison group baseline characteristics were compared with independent sample t- and X²-tests, respectively. Study outcomes for the different time points, baseline and follow-up 1 to 3, were analyzed by general linear model procedures for repeated measures. Hypothesis 2 was analyzed by a general linear model for ‘substance use in the last 30 days’ at the 4 time points as within factor, and ‘group affiliation’ (QCT or comparison group) as the between factor, including numerous baseline covariates, of those some are presented in table 2. Analogous analyses were performed for ‘crimes in the last 6 months’ at the 4 time points. Moreover, means and standard deviations were estimated in the controlled general linear models for hypothesis 2 and Bonferroni corrected ANOVAs were performed for these estimated values.

The reasons for leaving treatment were documented immediately after a drop-out and percents of drop-out reasons for each follow-up time point were calculated. Study retention for

hypothesis 3 was compared with similar general linear models used for hypothesis 2. Cox-regression survival analyses were performed to identify baseline predictors for treatment retention (days remained in treatment) in the QCT and the comparison group. All data were analyzed using the statistical software package SPSS, version 15.

Results

Groups' baseline characteristics

Overall, as expected, there were more male participants (see table 2 for additional baseline characteristics) than female participants (QCT: 53% males; comparison group: 62% males). There was a significantly higher proportion of females in the comparison group than in the QCT group ($X^2 = 12.22$, $df=3$, $p<0.001$) and more homeless participants in the QCT group (QCT: 20.6%; comparison group: 14.2%; $X^2=2.425$, $df=1$, $p<0.05$). The mean years of school education in the QCT group was lower than that in the comparison group (QCT: 9.61 ± 2.07 ; comparison group: 10.05 ± 2.20 ; $t=-2.980$, $df=842$, $p<0.01$) as was the longest period of regular employment (QCT: 4.18 ± 4.60 ; comparison group: 5.17 ± 5.28 ; $t=-2.825$, $df=802$, $p<0.01$). In line with these findings, the longest period of unemployment was higher in the QCT than in the comparison group (QCT: 4.68 ± 4.86 ; comparison group: 3.23 ± 4.18 ; $t=4.459$, $df=776$, $p<0.001$).

There was more medical care in the comparison group (QCT: 46.8%, comparison group: 54.1%; $X^2=-2.101$, $df=1$, $p<0.05$) and significantly more individuals in outpatient treatment in the QCT group than in the comparison group (QCT: 50.0%, comparison group: 34.9%; $X^2=19.595$, $df=1$, $p<0.001$).

Poly drug users were of similar frequency in the QCT and the comparison group (QCT: 24.9%, comparison group: 21.9%). Mean years of lifetime crack use, although crack users were not very prevalent (QCT: 4.0%, comparison group: 2.4%; $X^2=0.967$, $df=1$, n.s.), was higher in the QCT group (QCT: 1.99 ± 3.60 ; comparison group: 0.91 ± 2.38 ; $t=4.525$, $df=668$, $p<0.001$). Problematic alcohol users were of lower prevalence in the QCT group (QCT: 3.5%, comparison group: 6.5%; $X^2=-3.502$, $df=1$, $p<0.001$), and there were fewer mean years of excessive alcohol use in the QCT group (QCT: 3.12 ± 5.71 ; comparison group: 4.51 ± 8.03 ; $t=-2.623$, $df=686$, $p<0.01$).

The participants in the QCT group had committed more violent crimes in the past than did the voluntary participants (QCT: 0.65 ± 0.48 ; comparison group: 0.44 ± 0.50 ; $t=6.392$, $df=840$, $p<0.001$). At baseline, there were no differences for self-efficacy and stages of change (table

2), but for overall perceived pressure (QCT: 12.36 ± 3.78 ; comparison group: 11.25 ± 3.30 ; $t=4.571$, $df=842$, $p<0.001$).

Study Outcomes

A significant reduction in substance use is observed for the QCT group as well as the voluntary comparison group (QCT: $F=52.113$, $df=3$, $p<0.001$; comparison group: $F=48.412$, $df=3$, $p<0.001$), with a somewhat higher reduction in the QCT group over the entire 18 months ($F=4.960$, $df=1$, $p<0.05$). In both groups, the major reduction occurs during the first 6 months (between intake and FU1), thereafter the level of use remains relatively unchanged (see table 3 for more detailed study outcomes). The reduction follows different patterns in participants receiving in- and outpatient treatment. While inpatients show a major reduction during the first 6 months and an overall larger reduction ($F=28.471$, $df=1$, $p<0.001$), outpatients take more time to recover and reach major reductions between the 6th and 12th month (table 3). For those addicted to opiates, prescription of substitution substance did not change over the 18 months (QCT: $F=0.080$, $df=3$, n.s.; comparison group: $F=1.958$, $df=3$, n.s.) and did not differ between groups over time ($F=0.471$, $df=1$, n.s.). There were differences between in- and outpatients in frequency of participants with prescribed methadone ($F=31.274$, $df=1$, $p<0.001$), with higher prescription frequency in outpatients at all time points (data not shown).

The reduction of crime was also considerably high in both groups (QCT: $F=51.722$, $df=3$, $p<0.001$; comparison group: $F=37.253$, $df=3$, $p<0.001$), with a higher reduction over the entire 18 months in the QCT group ($F=29.258$, $df=1$, $p<0.001$). Again, participants receiving inpatient treatment showed a major reduction during the first 6 months (inpatients: $F=61.169$, $df=3$, $p<0.001$; outpatients: $F=24.411$, $df=3$, $p<0.001$), and an overall larger reduction ($F=13.678$, $df=1$, $p<0.001$) as compared to outpatients (table 3). There were slight improvements in overall health (QCT: $F=3.672$, $df=3$, $p<0.05$; comparison group: $F=5.790$, $df=3$, $p<0.001$) and rather stronger improvements in employment (QCT: $F=14.368$, $df=3$, $p<0.001$; comparison group: $F=36.624$, $df=3$, $p<0.001$) and mental health status (QCT: $F=12.874$, $df=3$, $p<0.001$; comparison group: $F=14.551$, $df=3$, $p<0.001$) in both groups. The overall health status ($F=20.582$, $df=1$, $p<0.001$) and the overall perceived pressure ($F=29.408$, $df=1$, $p<0.001$) were higher in the QCT group than in the comparison group at all time points and, consequently, differed over time. However, there were no significant differences for these groups in employment ($F=1.268$, $df=1$, n.s.), mental health status ($F=0.007$, $df=1$, n.s.), self-efficacy ($F=0.001$, $df=1$, n.s.), and stages of change ($F=1.441$, $df=1$, n.s.).

The GLM for ‘substance use in the last 30 days’, controlled for baseline factors, revealed no significant differences for groups over time ($F=2.425$, $df=3$, n.s.) and no significant differences between groups in the estimated means over time ($F=1.467$, $df=1$, n.s.). The GLM for the reduction of ‘crimes in the last 6 months’ was largest in the first 6 months and statistically significant for groups over time ($F=3.732$, $df=3$, $p<0.05$) and was highly significant between groups in the estimated means ($F=32.643$, $df=1$, $p<0.001$).

Drop-outs and retention

Within the 18 months following the intake, 47.1% of all participants dropped out of the study, with a major loss during the first 6 months (table 1). 4.9% participants in the QCT group and 1.7% participants in the voluntary group were arrested ($X^2=2.631$, $df=1$, $p<0.01$). Study retention was similar for both groups ($F=0.590$, $df=1$, n.s.) and did not differ between groups at any time point (FU1: QCT= 69.2%, comparison group= 66.8%, $X^2=2.447$, $df=1$, n.s.; FU2: QCT= 59.0%, comparison group= 56.5%, $X^2=2.021$, $df=1$, n.s.; FU3: QCT= 52.4%, comparison group= 53.4%, $X^2=0.420$, $df=1$, n.s.). However, survival analyses on treatment retention (days remained in treatment) yielded different baseline variables for the QCT and the comparison group. In the QCT group, criminal behavior last 6 months (OR=2.375, CI=(1.04-5.42), $p<0.05$), perceived pressure from the employer (OR=2.234, CI=(1.47-3.39), $p<0.001$), and treatment in Italy (OR=2.108, CI=(1.01-2.79), $p<0.001$) were significant baseline predictors for treatment retention. In the comparison group, the significant baseline predictors were being citizen of the respective country (OR=4.283, CI=(1.08-16.48), $p<0.05$), perceived legal pressure (OR=1.562, CI=(1.17-2.00), $p<0.01$), and again, treatment in Italy (OR=3.484, CI=(1.70-7.16), $p<0.01$).

Discussion

Overall, we were able to provide data and results from an extensive number of individuals in QCT and of adequate comparison groups from various treatment sites within 5 European countries, and we followed most of them for 18 months. Results demonstrated that there were reductions in substance use and crimes as well as improvements in overall and mental health and in employment status (social integration) in the QCT and in the comparison group. This is in line with other studies that suggest that QCT was at least as effective as voluntary treatment [15-19]. In line with other studies [e.g. 47], higher reductions of substance use were found for inpatient-treated than for outpatient-treated individuals in the first 6 months after treatment entry. Reductions of crime in the QCT and the comparison group were similar after

controlling for various factors. One interpretation of this finding is that subjects in the QCT and the comparison group respond to a similar extent in terms of reduction in crimes; however, as individuals in QCT entered treatment with a higher crime rate, they also end up with higher crime rates after 18 months.

Improvements in mental health did not differ between groups and improved extensively in the first treatment period, as was expected based on results of studies on the course of substance-using populations in treatment [47]. Interestingly, employment status improved over time, as expected based on other studies [15-19], but did not differ between groups. However, the comparison group, on average, had more sick days than did subjects in the QCT group. These results must be confirmed in future studies as comparable investigations using adequate comparison groups and including employment status and numbers of sick days have not been conducted. Surprisingly, perceived self-efficacy and overall perceived pressure did not substantially change over time. Less surprising was the fact that the stages of change characteristics in both groups did not change over time either, since the stages of change concept has often been criticized [e.g. 48].

Study retention did not differ between the QCT and the comparison group. This result supports some of our previous results [49] in which no differences in retention were found. However, survival analyses on treatment retention yielded interesting differences in some baseline outcome predictors, which have to be further investigated. Taken together, perceived pressure was rather unrelated to retention, as observed by other authors [50].

One limitation of the current study was that frequencies of substance use were based on self reports and could not be systematically collected by urine analyses. Similarly, crime measures were based on the ASI crime module, a relatively crude measure of self reports. Moreover, as with all multicenter studies, data collection from different treatment sites, underlying various socio-cultural and jurisdictional influences, may vary in ways that are difficult to control. However, the strategy to integrate data from different treatment sites within different countries with different legal situations for QCT sentencing policies and possibilities was an overall success.

According to the main study results, we conclude that QCT is effective in reducing substance use and crime and in improving health and social integration. Moreover, QCT is as effective in reducing substance use and crimes when compared to a voluntary comparison group treated in the same institutions after controlling for various factors discussed in the QCT literature and factors for which the groups showed differences at baseline. Therefore, offering substance-dependent offenders the option to receive treatment is an effective alternative to

imprisonment. Typically, the majority of substance dependent prison inmates resume drug use and criminal activities after release to the community [e.g. 28]. Such relapses were less common in offenders who entered QCT.

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Table 1: Overview of completed study interviews

Group	Intake	FU1	FU2	FU3
	n	n (%)	n (%)	n (%)
Completed interviews for countries				
United Kingdom	157	106 (67.5)	100 (63.7)	94 (59.9)
Italy	300	216 (72.0)	179 (59.7)	160 (53.3)
Austria	150	83 (55.3)	74 (49.3)	67 (44.7)
Switzerland	85	74 (87.1)	73 (85.9)	67 (78.8)
Germany	153	96 (62.7)	62 (40.5)	59 (38.6)
Total	845	575 (68.0)	488 (57.8)	447 (52.9)
Treatment status				
In treatment	845	474 (56.1)	348 (46.4)	291 (37.2)
Not in treatment	0	371 (43.9)	402 (53.6)	491 (62.8)
Missing	0	0 (0.0)	95 (11.2)	63 (7.5)

Table 2: Groups' baseline characteristics

	QCT	Comparison	F / Chi ²	Sig.
Male (%)	53	62	1.301	n.s.
Age (M, SD)	31.7, 7.5	31.0, 7.6		
Married (%)	11.0	11.3	0.060	n.s.
Non-nationals (%)	3.4	4.2	-0.568	n.s.
Years of education (M, SD)	9.6, 2.1	10.1, 2.2	2.980	<0.01
Longest period of unemployment (M, SD)	4.7, 4.9	3.2, 4.2	4.459	<0.001
Homeless (% last 30 days)	20.6	14.2	2.425	<0.05
Chronic health problems last 6 months (%)	51.9	47.6	1.274	n.s.
Received medical care last 6 months (%)	46.9	54.1	-2.101	<0.05
In outpatient treatment (%)	50.0	34.9	19.595	<0.001
Substance use:				
Poly drug user (% ^a)	24.9	21.9	1.223	n.s.
Heroin user (% ^a)	35.0	37.5	1.261	n.s.
Lifetime years of heroin use (M, SD)	6.9, 5.8	6.2, 5.5	2.894	n.s.
Cocaine user (% ^a)	18.9	15.4	0.258	n.s.
Lifetime years of cocaine use (M, SD)	5.1, 5.1	4.7, 5.0	0.968	n.s.
Crack user (% ^a)	4.0	2.4	0.967	n.s.

Lifetime years of crack use (M, SD)	2.0, 3.6	0.9, 2.4	4.525	<0.001
Methadone prescription (%)	21.2	25.6	-1.405	n.s.
Years of excessive alcohol (M, SD)	3.1, 5.7	4.5, 8.0	2.623	<0.01

Conducted crimes:

High severity crimes ever ^b (%)	46.3	40.3	6.170	<0.001
Medium severity crimes ever ^c (%)	30.2	30.1	0.006	n.s.
Low severity crimes ever ^d (%)	23.5	29.6	-3.832	<0.001

%^a percents with main substance of abuse; ^b category included for example, burglary, firearm and other weapons offences; ^c category included forgery, domestic crime; ^d category included for example, nuisance crimes, prostitution, pimping, and shoplifting

Table 3: Study outcomes (last observation carried forward)

Outcome	Group	Intake	Follow-up 1	Follow-up 2	Follow-up 3	Differences baseline to Follow-up 3		Between study groups comparisons	
						F	sig.	F	sig.
Main substance use	QCT (M; SD)	17.4; 13.6	11.4; 13.5	9.2; 12.7	9.5; 12.7	52.113	<0.001		
	Comparison group (M; SD)	15.4; 12.2	8.5; 12.1	8.3; 11.9	8.8; 12.2	48.412	<0.001	4.960	<0.05
Percent of >=1 crime	QCT (%)	59.9	36.4	33.1	33.1	51.722	<0.001		
	Comparison group (%)	41.8	21.4	19.7	22.1	37.253	<0.001	29.258	<0.001
Overall health ^a	QCT (M; SD)	2.9; 8.6	3.7; 9.4	2.4; 7.4	2.3; 7.3	3.672	<0.05		
	Comparison group (M; SD)	5.5; 10.9	6.6; 12.1	4.7; 10.4	4.5; 10.3	5.790	<0.001	20.582	<0.001
Employment status ^b	QCT (M; SD)	5.6; 10.6	8.0; 11.6	8.6; 11.2	9.0; 11.5	14.368	<0.001		
	Comparison group (M; SD)	3.3; 8.0	7.2; 11.3	8.4; 11.4	9.6; 11.8	36.624	<0.001	1.268	n.s.
Mental health ^c	QCT (%)	56.9	47.3	42.2	45.7	12.874	<0.001		
	Comparison group (%)	58.9	44.7	42.1	45.4	14.551	<0.001	0.007	n.s.
Self-efficacy	QCT (%)	3.4; 0.5	3.5; 0.5	3.4; 0.5	3.4; 0.5	0.624	n.s.		
	Comparison group (%)	3.4; 0.6	3.4; 0.6	3.5; 0.6	3.4; 0.5	2.777	n.s.	0.001	n.s.
Stages of change	QCT (%)	2.2; 0.8	2.3; 0.8	2.2; 0.9	2.2; 0.9	1.871	n.s.		
	Comparison group (%)	2.2; 0.8	2.2; 0.9	2.2; 0.9	2.2; 0.9	0.728	n.s.	1.441	n.s.
Overall perceived pressure	QCT (%)	12.4; 3.8	12.1; 3.9	12.2; 3.9	12.2; 3.9	0.846	n.s.		
	Comparison group (%)	11.2; 3.3	11.0; 3.4	11.0; 3.6	10.9; 3.4	2.350	n.s.	29.408	<0.001

^a days listed as sick during the last month; ^b mean working days in the last month; ^c percents with serious psychiatric problems in the last month